A STUDY OF THE ERRORS AND VIOLATIONS COMMITTED BY COLLEGE AND HIGH SCHOOL BASKETBALL TEAMS

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SCHOOL OF EDUCATION

Thesis

A STUDY OF THE ERRORS AND VIOLATIONS COMMITTED BY COLLEGE AND HIGH SCHOOL BASKETBALL TEAMS

Submitted by

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I wish to express my sincere appreciation and gratitude to Dr. G. L. Rarick, Boston University School of Education, for his help in planning and carrying out this thesis.

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TABLE OF CONTENTS

TABLE OF CONTENTS

LIST OF TABLES

LIST OF TABLES

CHAPTER I

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Purpose of the Study

"Improvements in any game are made through observation and study."[1]

During recent years there has been an increasing effort to determine some of the specific scientific aspects of the game of basketball. The general objectives of these studies were improvement of the game and improvement of coaching and teaching techniques. Formerly the box score was the main source of data for studies of basketball. Elbel and Allen, in regard to box score studies say, "There is quite general agreement that the box score does not give a very complete statistical picture of the game is consequently of little value to coach or player from the standpoint of game analysis."[2] This implies that more scientific studies are needed. In connection with this implication Dean states, "As the game of basketball becomes more and more scientific the coach of this very popular sport should

1/ Eugene Lambert, "Research and Changes in Basketball Rules." The Official Basketball Guide. 1947-48. New York: A. S. Barnes and Co., 1947, p. 21

2/ E. R. Elbel and F. C. Allen, "Evaluating Team and Individual Performance in Basketball." Research Quarterly, Vol. XII, No. 3, October, 1941, p. 538

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adopt a scientific attitude toward the game."[1]

One of the areas in which little scientific work has been done is that concerning the effect of errors and violations. Do errors and/or violations appreciably affect the outcome of the game? Do violations as they now appear in the rules of the game, unjustly penalize a team? To date, there has not been enough evidence based on scientific studies to provide a reasonably accurate answer to these questions. It was felt that these questions were of sufficient importance to warrant further scientific study.

The Problem

The specific problem is to determine the relationship, if any, which exists between the errors and violations committed by a team and the quality of that team's performance. In connection with this it was deemed advisable to make a comparison between high school and college basketball teams on the basis of errors and violations committed.

Review of the Literature

A survey of the literature revealed that there were relatively few published scientific studies dealing with the elements of the game of basketball as they appeared in the game situation. While many articles and some books written by outstanding coaches of the game may be found, the majority of

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these were based on trial and error experience and the opinions of the writers that have been formed as the results of their experiences rather than on scientific study.

A study conducted by Elbel and Allen[1] at the University of Kansas is one of the most objective to date. In an attempt to evaluate team and individual performances in the game situation, a list of defensive and offensive basketball items was developed. The list was then divided into positive and negative groups. The items in each group were ranked and given numerical weightings in order to serve as a basis of computing "offensive playing efficiency", "defensive playing efficiency", and "composite playing efficiency." The authors carried the study on for a three year period. They concluded that there is much information available in basketball games which is not used; that mistakes occur often and in some cases have little effect on the outcome; that team play is an important factor; and that some players who do little scoring contribute heavily to the success of the team.

Staton,[2] in a recent study, found that accuracy of shooting is an important factor in winning games; that bad passing, within certain limits, only slightly affects the outcome of a game; that scoring expectancy varies considerably between

1/ E. R. Elbel and F. C. Allen, Op. cit., p. 538-555

2/ Wesley M. Staton, "A Study of Certain Factors Associated with Individual and Team Performance in Collegiate Basketball." Unpublished Master's Thesis, Boston University, 1947

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A study conducted by Mabel and Allen[1] at the University of Kansas is one of the most objective to date. In an attempt to evaluate team and individual performances in the game situation, a list of defensive and offensive basketball items was developed. The list was then divided into positive and negative groups. The items in each group were ranked and given numerical weightings in order to serve as a basis of computing "offensive playing efficiency", "defensive playing efficiency", and "composite playing efficiency." The authors carried the study on for a three year period. They concluded that there is much information available in basketball games which is not used; that mistakes occur often and in some cases have little effect on the outcome; that team play is an important factor; and that some players who do little scoring contribute heavily to the success of the team.

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[1] F. R. Mabel and T. C. Allen, Op. cit., p. 338-358

[2] Wesley M. Staton, "A Study of Certain Factors Associated with Individual and Team Performance in Collegiate Basketball." Unpublished Master's Thesis, Boston University, 1947

certain zones of the court; and that ball possession time had little influence on the outcome of the game. Twenty-eight intercollegiate games provided the data and 312 individual players were included in the investigation.

Much of the literature pertains to methods and techniques used by individual coaches. For example, Dean[1/] describes use of graphs in keeping records of free throws made in game situations and during practice sessions.

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CHAPTER II

PROCEDURE

Data collected from thirty intercollegiate basketball games and thirty interscholastic basketball games were included in this study. All of these games were played on either the Boston Garden or Boston Arena courts. Since these two courts were of the same dimensions and have comparable physical surroundings and lighting systems and since the same group of officials worked all the games, it was felt that this would be a logical means of equating the playing situation. There were thirty different college teams and forty-seven different high school teams involved in the sixty games from which data were collected.

Method of Collecting Data

In order to clearly differentiate between errors and violations The Official Basketball Guide[1] was examined and the violations included therein were utilized as a basis for this study. While it is recognized that violations may be considered errors, they were not so classified in this study.

A list of errors was derived as a result of interviewing a number of basketball coaches and students of the game.

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This original list was used in the practice games attended. It was narrowed down to six items which proved to be reasonably objective in nature. Hereafter the term "error" will refer to the list of six items and the term "violation" will refer to the list of eighteen items which were extracted from The Official Basketball Guide. These lists appear under the section on definitions of terms.

Prior to the recording of data for the study, eight practice games were attended and data were taken for purposes of refining the collection techniques. The violations were recorded as they were called by the officials. The errors were recorded as the recorders saw them. Two recorders, both of whom were Boston University graduate students majoring in physical education, kept separate records on the games. A reliability check on a percentage basis indicated that the two recorders called the same error ninety-nine per cent of the time. Since the violations were recorded only when they were called by the officials there were no discrepancies between the two recorders in recording violations. Through the courtesy of the Boston Garden-Arena Corporation the two recorders were given seats for the season in the Press Box. This guaranteed the same observational point of view for the two recorders at each game. Games from which data were collected covered the period from December 9, 1947 through March 12, 1948.

Definitions of Terms

The errors and violations and their definitions as used in this study were as follows:

Error

An error as used in this study was:

1. Any act, other than a violation, which caused a team to lose possession of the ball and the opposing team to gain possession, or
2. When a foul was committed by either the defensive or the offensive team, or
3. When a held ball was called by an official.

List of Errors

Item 1. Intercepted pass.
An error was charged to a team whenever any player of that team, while having possession of the ball, attempted to pass the ball to a team mate and in that attempt possession of the ball was obtained by the opponents. To fall into this category the ball must have clearly left the hands of the passer, and the act of throwing or passing must not have been any direct attempt to score a field goal.

Item 2. Committed foul.
An error was charged to a team when any player of that team committed an infraction of the rules, the penalty for which was one or more free throws.

Item 3. Fumbled ball obtained by opponents.
An error was charged to a team when any player on that team, being in possession of the ball, dropped, juggled, fumbled, or temporarily lost control of the ball and a member of the opposing team gained complete possession of it.

Item 4. Held ball forced by an opponent.
An error was charged to a team when any player on that team having possession of the ball was forced into a held ball by a member or members of the opposing team.
A held ball is declared by the official when two players of opposing teams have one or

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A held ball is declared by the official when two players of opposing teams have one or

both hands firmly on the ball, or when one closely guarded player is withholding the ball from play in his front court and is making no apparent effort to put the ball into play.[1]

Item 5. Missed field goal recovered by an opponent. An error was charged against a team whenever any member of that team attempted a field goal and a member of the opposing team gained immediate possession of the ball by recovering the rebound.

Item 6. Missed free throw recovered by an opponent. An error was charged against a team whenever any member of that team having been awarded a free throw missed the free throw and a member of the opposing team gained immediate possession of the ball by recovering the rebound.

Violation

"A violation is a rule infraction not involving a foul."[2]

List of Violations

Item 7. Caused the ball to go out of bounds. A player shall not cause the ball to go out of bounds.[3]

Item 8. Double dribble. A player shall not make a second dribble after having completed a dribble, unless the ball when it was out of his control has touched another player, or his own basket or backboard, or has been batted out of his control by an opponent.[4]

1/ The Official Basketball Guide, Op. cit., Rule 4, Section 10, p. 16

2/ Ibid, Rule 4, Section 18, p. 19

3/ Ibid, Rule 9, Section 2, p. 31

4/ Ibid, Rule 9, Section 5, p. 32

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1/ The Official Basketball Guide, Op. cit., Rule 4, Section 10, p. 18

2/ Ibid, Rule 4, Section 18, p. 19

3/ Ibid, Rule 9, Section 3, p. 31

4/ Ibid, Rule 9, Section 8, p. 32

Item 9. Travelling.
A player shall not run with the ball.[1]

Item 10. Caused the ball to go into the back court.
The team in control of the ball shall not cause it to go from front court to back court. Exception: After jump ball, any one of the eight non jumpers who first touches the tapped ball may cause it to go to back court once.[2]

Item 11. Failed to cross the restraining line within ten seconds.
When a team gains control of the ball in its back court, that team must advance the ball to its front court within a period of ten seconds unless the ball, while out of control of the team, touches or is touched by an opponent.[3]

Item 12. Entered the restraining circle on a jump ball.
When a jump ball takes place at center, or in one of the free throw restraining circles, the eight non jumpers shall remain outside the restraining circle (cylinder) until the ball has been tapped. When a jump ball is not in a restraining circle, similar provisions apply except that imaginary circles at reasonable distance from the jumpers are used.[4]

Item 13. Kicked or punched the ball.
A player shall not kick the ball or strike it with the fist. (Kicking the ball is a violation only when it is a positive act; accidentally striking the ball with the foot or leg is not a violation).[5]

1/ The Official Basketball Guide, Op. cit., Rule 9, Section 4, p. 31

2/ Ibid, Rule 6, Section 6, (b), p. 26

3/ Ibid, Rule 6, Section 6, (a), p. 25

4/ Ibid, Rule 6, Section 3, p. 24

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Item 14. Offensive player remained more than three seconds within the offensive free throw line.
A player shall not remain for more than three seconds in that part of his free throw area between the end line and the farther edge of the free throw line while the ball is in control of his team.1/

Item 15. Carried ball into court from out of bounds.
A player, who has been awarded the ball out of bounds, shall not carry the ball into the court.2/

Item 16. Consumed more than five seconds in putting the ball into play from out of bounds.
A player who has been awarded the ball out of bounds, shall not consume more than five seconds in putting the ball into play.3/

Item 17. Interfered with the ball while on ring, within basket, or on downward flight.
A player shall not touch his own basket while the ball is on the ring during a try for field goal; or touch the ball or opponent's basket while the ball is on or within such basket or touch the ball while the touching hand or arm is also touching the opponent's basket or is directly above such basket; or touch the ball during an opponent's throw for field goal and while the entire ball is above the level of the basket ring. This latter restriction applies only until such throw for goal has touched the ring or backboard or until it is apparent it will not touch either.4/

Item 18. Touched free throw lane before ball hits backboard or ring.
After the ball is placed at the disposal of the free-thrower he shall not touch the

1/ The Official Basketball Guide, Op. cit., Section 7, p. 32

2/ Ibid, Rule 9, Section 3, (a), p. 31

3/ Ibid, Rule 9, Section 3, (a), p. 31

4/ Ibid, Rule 9, Sections 8, 9, 10, pp. 32-33

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floor on or across the free throw line and no other player of either team shall touch the free throw lane. (This restriction applies only until the ball touches the ring or backboard or until it is apparent that it will touch neither).[1]

Item 19. Touched ball, after putting it into play from out of bounds, before it is touched by another player.

A player, who has been awarded the ball out of bounds, shall not touch it in the court until it has been touched by another player.[2]

Item 20. Used more than ten seconds to throw a free throw.

When the ball has been placed at the disposal of the free-thrower, he shall throw within ten seconds.[3]

Item 21. Touched the ball before it reaches its highest point, or leave the jumping circle until the ball has been tapped.

Neither jumper shall tap the ball before it reaches its highest point, or leave the jumping circle until the ball has been tapped.[4]

Item 22. On a jump ball, touched ball more than twice before ball touches floor, backboard, or any other player.

Either jumper may tap the ball only twice. After the second tap by a jumper, he shall not touch the ball again until it has touched one of the eight non-jumpers, the floor, the basket, or the backboard.[5]

Item 23. Touched ball or basket while attempting or while a team mate is attempting a free throw.

After the ball is placed at the disposal of the free-thrower neither he nor a team

1/ The Official Basketball Guide, Op. cit., Rule 9, Section 1, (c), p. 30

2/ Ibid, Rule 9, Section 3, (a), p. 31

3/ Ibid, Rule 9, Section 1, (a), p. 30

4/ Ibid, Rule 6, Section 3, p. 24

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mate shall touch the ball or basket while the ball is on or within the basket.[1]

Item 24. Free throw did not touch rim or backboard. After the ball is placed at the disposal of the free-thrower, he shall throw in such a way that the ball enters the basket or touches the ring before it is touched by a player.[2]

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Item 24. Free throw did not touch rim or backboard.
After the ball is placed at the disposal of
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CHAPTER III

ANALYSIS OF DATA

Since this study was concerned with team performance, the results will be referred to in terms of winning teams and losing teams. Table I indicates the frequency with which the errors and violations occured in the thirty college game situations and Table II indicates the frequency with which they occured in the thirty high school game situations.

TABLE I

FREQUENCY OF ERRORS AND VIOLATIONS COMMITTED IN THIRTY COLLEGE BASKETBALL GAMES

	Item	Winning teams	Losing teams
*	1	232	290
*	2	516	551
	3	99	133
	4	96	101
*	5	694	895
	6	112	117
*	total errors	1749	2087
*	7	526	438
	8	25	15
	9	106	106
	10	7	3
	11	0	0
	12	1	0
	13	8	7
	14	10	7
	15	2	1
	16	0	1
	17	0	0
	18	0	0
	19	0	0
	20	0	0
	21	0	0
	22	0	3
	23	0	0
	24	1	7
*	total violations	686	588
*	total errors and violations	2435	2675

*Items to be dealt with in greater detail

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Since this study was concerned with team performance, the results will be referred to in terms of winning teams and losing teams. Table I indicates the frequency with which the errors and violations occured in the thirty college game situations and Table II indicates the frequency with which they occurred in the thirty high school game situations.

TABLE I

FREQUENCY OF ERRORS AND VIOLATIONS COMMITTED IN THIRTY COLLEGE BASKETBALL GAMES

	Item	Winning teams	Losing teams
*	1	282	290
*	2	316	351
	3	99	155
	4	96	101
*	5	694	895
	6	112	117
*	total errors	1749	2087
*	7	326	458
	8	25	15
	9	106	106
	10	7	3
	11	0	0
	12	1	0
	13	8	7
	14	10	17
	15	2	1
	16	0	1
	17	0	0
	18	0	0
	19	0	0
	20	0	0
	21	0	0
	22	0	3
	23	0	0
	24	1	7
*	total violations	656	583
*	total errors and violations	2435	2675

*Items to be dealt with in greater detail

TABLE II

FREQUENCY OF ERRORS AND VIOLATIONS COMMITTED IN THIRTY HIGH SCHOOL BASKETBALL GAMES

	Item	Winning teams	Losing teams
*	1	222	280
*	2	390	406
	3	129	147
	4	212	194
*	5	535	614
	6	85	105
*	total errors	1573	1746
*	7	382	403
	8	36	33
	9	106	73
	10	10	7
	11	0	1
	12	0	0
	13	7	4
	14	8	8
	15	4	0
	16	2	0
	17	0	0
	18	2	3
	19	1	0
	20	0	0
	21	1	1
	22	0	4
	23	0	0
	24	7	10
*	total violations	566	547
*	total errors and violations	2139	2293

*Items to be dealt with in greater detail

From a study of the two tables above it appeared meaningless to apply further statistical treatment to a majority of the items that were included in the study because of the relative small frequency with which those items occurred in the game situation. Therefore only those items and totals having a frequency of more than two hundred for both winning

TABLE II

FREQUENCY OF ERRORS AND VIOLATIONS COMMITTED IN THIRTY HIGH SCHOOL BASKETBALL GAMES

	Item	Winning teams	Losing teams
*	1	332	280
*	2	330	208
	3	129	147
	4	212	196
*	5	338	214
	6	85	105
*	total errors	1572	1746
*	7	382	403
	8	86	33
	9	108	73
	10	10	7
	11	0	1
	12	0	0
	13	7	4
	14	8	8
	15	4	0
	16	2	0
	17	0	0
	18	2	3
	19	1	0
	20	0	0
	21	1	1
	22	0	4
	23	0	0
	24	7	10
*	total violations	566	547
*	total errors and violations	2138	2293

*Items to be dealt with in greater detail

From a study of the two tables above it appeared meaningless to apply further statistical treatment to a majority of the items that were included in the study because of the relative small frequency with which those items occurred in the game situation. Therefore only those items and totals having a frequency of more than two hundred for both winning

and losing teams were arbitrarily selected for further statistical treatment. A quick review of the two tables above will disclose the fact that the selected items were the same for both the college and high school teams. They are listed below:

Item 1 -------- Intercepted pass
Item 2 -------- Committed a foul
Item 3 -------- Missed field goal recovered by opponent
Total of errors committed
Item 7 -------- Caused the ball to go out of bounds
Total of violations committed
Total of errors and violations committed

Discussion of Selected Items

Intercepted Pass.-- The critical reader will, no doubt, question the charging of an error against a team every time one of the passes of that team is intercepted. It is recognized that sometimes a pass is intercepted because of the ability of one of the defensive players to sense the situation. However, it would be an extremely difficult task to divide intercepted passes into those due to an error in judgment or ability on the part of the person throwing the pass and those due to the positive playing ability of the person who intercepts the pass. In order to eliminate the element of subjectivity as far as possible, it was arbitrarily decided that all intercepted passes would be charged as an error against the team that threw the pass.

Committed a Foul.-- Fouls in this study were considered

and losing teams were arbitrarily selected for further statistical treatment. A quick review of the two tables above will disclose the fact that the selected items were the same for both the college and high school teams. They are listed below:

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Committed a Foul.-- Fouls in this study were considered

as errors committed by the team whose member had committed the offense. While situations may arise in which a foul might appear to be good strategy the rules are not so designed. Hence, if the intent of the rule is followed, a foul logically must be considered as an error.

Missed Field Goal Recovered by Opponent.-- While it is realized that a field goal cannot be made unless a shot is taken, there is little question that many shots are attempted in which there is very little chance that the goal will be made. The problem resolved itself into whether or not the team making an unsuccessful attempt at a field goal should be charged with an error. Several different approaches were tried out in an attempt to find one that would be objective and yet not subject any team to being charged with unnecessary errors. The method arbitrarily selected was to charge an error against any team when a member of that team attempted a shot and it was recovered by a member of the opposing team.

Caused Ball to go Out of Bounds.-- This was the only violation that appeared enough times to warrent inclusion in the statistical treatment of the data. All acts that caused the ball to go out of bounds were included in this one category.

Total of Errors; Total of Violations; and Total of Errors and Violations.-- These are merely the summations of the frequencies of all errors, all violations, and both errors and

as errors committed by the team whose member had committed the offense. While situations may arise in which a foul might appear to be good strategy the rules are not so designed. Hence, if the intent of the rule is followed, a foul logically must be considered as an error.

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violations. While a great many of the individual items did not appear very often in the game situation the total frequency of errors and violations was high enough to be significant in the statistical treatment of the data.

Table III reveals the mean and standard error of the mean of selected items for winning and losing college teams; similar information is found for the winning and losing high school teams in Table IV.

TABLE III

THE FREQUENCY, MEAN, AND STANDARD ERROR OF THE MEAN OF SELECTED ERRORS, VIOLATIONS, AND TOTAL ERRORS AND VIOLATIONS COMMITTED BY WINNING AND LOSING COLLEGE BASKETBALL TEAMS IN THIRTY GAME SITUATIONS

	Winning Teams		Losing Teams	
Item	f	Mean	f	Mean
1	232	7.73 ± .68	290	9.67 ± .73
2	516	17.20 ± .99	551	18.37 ± .82
5	694	23.13 ± .98	895	29.83 ± 1.06
Total Errors	1749	58.30 ± 1.61	2087	69.57 ± 1.62
7	526	17.53 ± .89	438	14.60 ± .80
Total Violations	686	22.87 ± 1.13	588	19.60 ± .76
Total Errors and Violations	2435	81.17 ± 1.88	2675	89.17 ± 1.95

It will be noted that the winning teams committed fewer total errors and fewer individual errors than did the losing teams. On the other hand, the losing teams committed fewer total violations and committed violation number seven (caused ball to go out of bounds) with less frequency than did the winning teams.

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THE FREQUENCY, MEAN, AND STANDARD ERROR OF THE MEAN OF SELECTED ERRORS, VIOLATIONS, AND TOTAL ERRORS AND VIOLATIONS COMMITTED BY WINNING AND LOSING COLLEGE BASKETBALL TEAMS IN THIRTY GAME SITUATIONS

Item	Winning Teams f	Winning Teams Mean	Losing Teams f	Losing Teams Mean
1	252	7.73 ± .38	290	9.67 ± .73
2	516	17.20 ± .39	851	18.37 ± .82
3	694	23.13 ± .98	895	28.83 ± 1.08
Total Errors	1749	58.30 ± 1.61	2087	69.67 ± 1.82
4	526	17.53 ± .89	438	14.60 ± .80
Total Violations	666	22.37 ± 1.13	888	19.80 ± .76
Total Errors and Violations	2438	81.17 ± 1.88	2975	89.17 ± 1.95

It will be noted that the winning teams committed fewer total errors and fewer individual errors than did the losing teams. On the other hand, the losing teams committed fewer total violations and committed violation number seven (caused ball to go out of bounds) with less frequency than did the winning teams.

TABLE IV

THE FREQUENCY, MEAN, AND STANDARD ERROR OF THE MEAN OF SELECTED ERRORS, VIOLATIONS, AND TOTAL ERRORS AND VIOLATIONS COMMITTED BY WINNING AND LOSING HIGH SCHOOL BASKETBALL TEAMS IN THIRTY GAME SITUATIONS

	Winning Teams		Losing Teams	
Item	f	Mean	f	Mean
1	222	7.40 ± .76	280	9.33 ± .86
2	390	13.00 ± .78	406	13.53 ± .78
5	535	17.83 ± .86	614	20.45 ± .91
Total Errors	1573	52.43 ± 1.34	1746	58.20 ± 1.37
7	382	12.73 ± .78	403	13.43 ± .74
Total Violations	566	18.87 ± .75	547	18.23 ± 1.10
Total Errors and Violations	2139	71.30 ± 1.55	2293	76.43 ± 1.83

The winning high school teams committed fewer errors, violations, and total errors as far as the selected items were concerned. The losing high school teams committed fewer total violations than did the winning teams.

If one started with a basic assumption that the elements influencing the performance of the teams equally affect both teams and if the abilities of both teams are equal, the game should result in a tie with both teams committing the same number of errors and violations. Therefore, if all elements of the game other than errors and violations were held constant, one could logically infer that as the difference in score between winning and losing teams increased there would be an increase in the difference between errors and/or violations committed, with the losing team committing the

TABLE IV

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Item	Winning Teams		Losing Teams	
	f	Mean	f	Mean
1	322	7.40 ± .76	280	9.35 ± .86
2	390	13.00 ± .78	406	18.83 ± .78
3	585	19.83 ± .86	614	30.48 ± .91
Total Errors	1075	58.43 ± 1.34	1746	38.20 ± 1.37
4	382	18.73 ± .78	403	18.43 ± .74
Total Violations	566	18.87 ± .75	547	18.28 ± 1.10
Total Errors and Violations	8139	71.30 ± 1.85	2293	76.43 ± 1.83

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greater number. Using the Pearson-product moment method, correlations were computed on the relationship between the differences in scores and the differences in errors and violations committed by the winning and losing teams. The correlations obtained for both the college and high school teams are shown below:

Correlation	College Teams		High School Teams	
r0 1 ----------	+.33	±.11	-.21	±.11
r0 2 ----------	+.42	±.10	+.28	±.11
r0 5 ----------	+.42	±.10	+.62	±.07
r0 A ----------	+.76	±.05	+.62	±.07
r0 7 ----------	-.20	±.11	-.02	±.12
r0 B ----------	-.05	±.12	-.18	±.12
r0 C ----------	+.68	±.07	+.58	±.08

r0---Difference in points scored between winning and losing teams.
r1---Difference in frequency of intercepted passes committed by winning and losing teams
r2---Difference in frequency of fouls committed by winning and losing teams
r5---Difference in frequency of missed field goals recovered by opponents
rA---Difference in frequency of total errors committed by winning and losing teams
r7---Difference in frequency of causing ball to go out of bounds
rB---Difference in frequency of total violations committed by winning and losing teams
rC---Difference in frequency of total errors and violations committed by winning and losing teams

There are several interesting facts to be observed in the correlations above. First, the differences in total errors committed correlated highest with the constant, i.e., differences in points scored between winning and losing teams, for both the college and high school teams. However, for the

greater number. Using the Pearson-product moment method, correlations were computed on the relationship between the differences in scores and the differences in errors and violations committed by the winning and losing teams. The correlations obtained for both the college and high school teams are shown below:

Correlation	College Teams		High School Teams	
ro 1 ----------	+.33	±.11	-.21	±.11
ro 2 ----------	+.42	±.10	+.28	±.11
ro 3 ----------	+.42	±.10	+.82	±.07
ro 4 ----------	+.76	±.05	+.82	±.07
ro 7 ----------	-.80	±.11	-.02	±.13
ro 8 ----------	-.05	±.13	-.18	±.13
ro 6 ----------	+.68	±.07	+.52	±.08

ro---Difference in points scored between winning and losing teams.

r1---Difference in frequency of intercepted passes committed by winning and losing teams

r2---Difference in frequency of fouls committed by winning and losing teams

r3---Difference in frequency of missed field goals recovered by opponents

r4---Difference in frequency of total errors committed by winning and losing teams

r7---Difference in frequency of causing ball to go out of bounds

r8---Difference in frequency of total violations committed by winning and losing teams

r6---Difference in frequency of total errors and violations committed by winning and losing teams

There are several interesting facts to be observed in the correlations above. First, the differences in total errors committed correlated highest with the constant, i.e., differences in points scored between winning and losing teams, for both the college and high school teams. However, for the

high school teams the same coefficient was obtained when correlating the differences in frequency of missed field goals recovered by opponents with the constant. The second highest coefficient of correlation for both college and high school teams was obtained between the constant and the difference in total errors and violations committed by winning and losing teams. It is recognized that this is influenced by the relatively high correlation between the constant and the differences in errors committed. The differences in total violations committed when correlated with the constant produced very low coefficients for both groups. This seems to indicate that the ciolations as they now appear in the rules have relatively little relationship to the outcome of the game. The rest of the correlations obtained were so small as to indicate that not much relationship exists.

Critical Ratios (errors, violations, and errors and violations).-- In order to lend meaning to the observed means shown in Tables II and IV, (page 17 and 18), the difference between the means for each item was computed and the significance of the differences in each case was

determined.

In referring to tests of significance Lindquist says,[1]

> It should be noted that it is by no means desirable to insist on the same level of significance in all tests of significance. The choice of the level of significance to employ should be based on the relative consequences of the two types of errors that are risked. On the one hand, we run the risk of accepting the null hypothesis when it is true, i.e., of characterizing a difference as not significant when a real difference does exist; and on the other hand we risk rejecting the null hypothesis when it is true, i.e., of claiming significance when the difference is really due to chance.

1/ E. F. Lindquist, Statistical Analysis in Educational Research. New York: Houghton-Mifflin Company, 1942, p. 16

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[1] E. F. Lindquist, Statistical Analysis in Educational Research. New York: Houghton-Mifflin Company, 1940, p. 14

Due to the limited number of games observed, and because of the element of human error that is inherant in the task of officiating, it was felt that the 0.1 per cent level of significance should be used throughout this study. Hence, only those differences in which the critical ratio 3.0 or more were considered as being statistically significant.

The critical ratios between the winning and losing teams for the considered errors, violations, and total errors and violation were found to be as follows:

	College	High School
Intercepted pass	3.40	1.53
Committed a foul	1.26	.72
Missed field goal recovered by an opponent	6.09	3.47
Total errors committed	10.06	4.89
Caused ball to go out of bounds	2.24	.65
Total violations committed	2.40	.44
Total errors and violations committed	5.23	4.24

On the basis of Sorenson's[1] table, indicating the chances in 1000 which a true difference would be expected to occur, the following values were assigned.

10.06	999.997 +
6.09	999.997 +
5.23	999.997 +
4.89	999.997 +
4.24	999.98
3.47	999.75
3.40	999.7
2.40	992.
2.24	987.
1.53	937.
1.26	896.
.72	764.
.65	742.
.44	670.

1/ Herbert Sorenson, Statistics for Students of Psychology and Education. New York: McGraw-Hill, 1936, p. 367

Due to the limited number of games observed, and because of the element of human error that is inherent in the task of officiating, it was felt that the 0.1 per cent level of significance should be used throughout this study. Hence, only those differences in which the critical ratio 3.0 or more were considered as being statistically significant.

The critical ratios between the winning and losing teams for the considered errors, violations, and total errors and violation were found to be as follows:

	College	High School
Intercepted pass ----------	3.40	1.53
Committed a foul ----------	1.26	.72
Missed field goal recovered by an opponent ----------	6.09	3.47
Total errors committed ----------	10.06	4.89
Caused ball to go out of bounds-	3.84	.85
Total violations committed------	2.40	.44
Total errors and violations committed ----------	5.25	4.24

On the basis of Sorenson's[1] table, indicating the chances in 100 which a true difference would be expected to occur, the following values were assigned.

10.06 ----------	999.997 +
6.09 ----------	999.997 +
3.84 ----------	999.997 +
3.40 ----------	999.997 +
4.24 ----------	999.99
3.47 ----------	999.75
3.40 ----------	999.7
2.40 ----------	992.
2.24 ----------	987.
1.53 ----------	937.
1.26 ----------	896.
.72 ----------	764.
.65 ----------	742.
.44 ----------	670.

[1] Herbert Sorenson, Statistics for Students of Psychology and Education. New York: McGraw-Hill, 1936, p. 327

A review of the critical ratios that were derived indicates that in both the college and high school games the difference in errors committed was due to some factor other than chance. Also, it will be noted that the differences in violations committed between winning and losing teams for both colleges and high schools were not statistically significant.

With reference to the basic assumption used in this study, (see page 18) it was realized that it would be impossible to hold constant all the elements of the game. Also, it would be impossible to gather data on games where it could be said that the abilities of both teams were exactly equal. However, it was felt that if the logic were correct and if the sampling were large enough, the results obtained would approach those set forth in the basic assumption. To test this, the thirty college game situations were arranged in such a way that the point differential progressively increased from the least difference to the greatest; the same was done for the thirty high school games. Then the lists were divided arbitrarily into two approximately equal groups, the first containing those games in which the point differentials were the smaller, and the other containing the games where the point differentials were the greater. The data were treated statistically in the same way as the data on the thirty grames. Since the divisions for the college and high school games were made at different points, each was treated separately and not on a

comparative basis.

Table V shows the thirty college games arranged in order of increasing point difference. The games are designated by letters of the alphabet based upon increasing point differentials. The second column in the table shows the sequence in which the games were played.

TABLE V

THIRTY COLLEGE BASKETBALL GAMES ARRANGED IN ORDER OF INCREASING POINT DIFFERENCE

Game Designation	Game Number	Winner's Score	Loser's Score	Point Difference
A	8	55	53	2
B	13	47	45	2
C	29	65	62	3
D	4	68	62	6
E	15	56	50	6
F	9	48	42	6
G	10	66	57	9
H	3	63	54	9
I	26	58	49	9
J	18	71	61	10
K	24	64	54	10
L	21	70	59	11
M	17	45	34	11
N	19	45	34	11
O	5	62	50	12
P	7	60	48	12
Q	30	59	47	12
R	27	61	48	13
S	6	75	61	14
T	23	62	46	16
U	2	52	36	16
V	14	61	44	17
W	22	48	30	18
X	12	70	51	19
Y	20	62	36	26
Z	11	76	49	27
AA	16	71	44	27
BB	28	80	51	29
CC	1	80	45	35
DD	25	90	35	55

comparative basis.

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H	3	63	54	9
I	26	58	49	9
J	18	71	61	10
K	24	64	54	10
L	21	70	59	11
M	17	45	34	11
N	19	45	34	11
O	5	62	50	12
P	7	60	48	12
Q	30	59	47	12
R	27	61	48	13
S	6	75	61	14
T	23	62	46	16
U	2	52	36	16
V	14	61	44	17
W	22	48	30	18
X	12	70	51	19
Y	20	62	36	26
Z	11	75	49	27
AA	16	71	44	27
BB	28	80	51	29
CC	1	80	45	35
DD	25	90	55	35

The games listed above were arbitrarily divided into two groups, one group having a large point difference, the other having a small point difference. As will be noted from Table V, the break was made at a point difference of eleven points or between games N and O which places approximately the same number of games in the two groups. A study of the games by sequence shows that only seven of the first fifteen games played were in the top group. It is possible that this might have been due to the fact that the teams did not reach their maximum playing efficiency until the middle or late season.

Hereafter, the group where the point differences were the least will be referred to as Group A-N, and the group where the point differences were the greatest will be referred to as Group O-DD. In the statistical treatment of the data for these two groups only the total errors, total violations, and total errors and violations were considered. Table VI indicates the frequencies, means, and standard errors of items considered for the winning teams in Groups A-N and O-DD.

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TABLE VI

THE FREQUENCY, MEAN, AND STANDARD ERROR OF THE MEAN OF TOTAL ERRORS, TOTAL VIOLATIONS, AND TOTAL ERRORS AND VIOLATIONS COMMITTED BY WINNING COLLEGE BASKETBALL TEAMS

	Group A-N Winning Teams		Group O-DD Winning Teams	
Item	f	Mean	f	Mean
Total Errors	838	59.86 ± 2.99	911	56.94 ± 1.68
Total Violations	325	23.21 ± 1.58	361	22.56 ± 1.65
Total Errors and Violations	1163	83.07 ± 2.76	1272	79.50 ± 2.19

Table VII indicates the frequencies, means, and standard errors of the items previously considered for losing teams in groups A-N and O-DD.

TABLE VII

THE FREQUENCY, MEAN, AND STANDARD ERROR OF THE MEAN OF TOTAL ERRORS, TOTAL VIOLATIONS, AND TOTAL ERRORS AND VIOLATIONS COMMITTED BY LOSING COLLEGE BASKETBALL TEAMS

	Group A-N Losing Teams		Group O-DD Losing Teams	
Item	f	Mean	f	Mean
Total Errors	922	65.88 ± 2.41	1165	72.81 ± 1.88
Total Violations	281	20.07 ± 1.39	307	19.19 ± .78
Total Errors and Violations	1203	85.93 ± 3.35	1472	92.00 ± 1.83

When comparing the results above it should be remembered that the number of games included in each of the two groups are different. Therefore, only the means should be used in the making of comparisons. It will be observed that the winning teams in Group A-N where the difference in scores was

TABLE VI

THE FREQUENCY, MEAN, AND STANDARD ERROR OF THE MEAN OF TOTAL ERRORS, TOTAL VIOLATIONS, AND TOTAL ERRORS AND VIOLATIONS COMMITTED BY WINNING COLLEGE BASKETBALL TEAMS

Item	Group A-N Winning Teams		Group O-DD Winning Teams	
	f	Mean	f	Mean
Total Errors	838	59.86 ± 2.99	911	56.94 ± 1.88
Total Violations	325	85.21 ± 1.88	801	22.56 ± 1.88
Total Errors and Violations	1163	83.07 ± 2.76	1272	79.50 ± 2.19

Table VII indicates the frequencies, means, and standard errors of the items previously considered for losing teams in Groups A-N and O-DD.

TABLE VII

THE FREQUENCY, MEAN, AND STANDARD ERROR OF THE MEAN OF TOTAL ERRORS, TOTAL VIOLATIONS, AND TOTAL ERRORS AND VIOLATIONS COMMITTED BY LOSING COLLEGE BASKETBALL TEAMS

Item	Group A-N Losing Teams		Group O-DD Losing Teams	
	f	Mean	f	Mean
Total Errors	982	68.88 ± 3.41	1165	72.81 ± 1.88
Total Violations	881	80.07 ± 1.89	807	19.19 ± .78
Total Errors and Violations	1203	85.93 ± 3.35	1472	98.00 ± 1.85

When comparing the results above it should be remembered that the number of games included in each of the two Groups are different. Therefore, only the means should be used in the making of comparisons. It will be observed that the winning teams in Group A-N where the difference in scores was

the least, averaged more errors, more violations, and more total errors and violations than did the winning teams in Group O-DD where the differences in scores were the greatest. On the other hand, the losing teams in Group A-N averaged less errors, more violations, and less total errors and violations than did the losing teams in Group O-DD

Correlations, using the Pearson-product moment method, were computed on the relationship between the differences in scores and the differences in total errors, total violations, and total errors and violations committed by the winning and losing teams for groups A-N and O-DD. These are shown below.

Correlation	Group A-N	Group O-DD
rO A	+.54 ± .13	+.73 ± .08
rO B	-.26 ± .17	-.14 ± .17
rO C	+.26 ± .17	+.50 ± .13

rO---Difference in points scored between winning and losing teams
rA---Difference in frequency of total errors committed by winning and losing teams
rB---Difference in frequency of total violations committed by winning and losing teams
rC---Difference in frequency of total errors and violations committed by winning and losing teams

The critical ratios between the winning and losing teams for total errors, total violations, and total errors and violations were computed for groups A-N and O-DD and were found to be as follows:

	Group A-N	Group O-DD
Total errors----------	2.20	12.02
Total violations----------	1.33	1.76
Total errors and violations--	.77	6.16

the least, averaged more errors, more violations, and more total errors and violations than did the winning teams in Group 0-DD where the differences in scores were the greatest. On the other hand, the losing teams in Group A-N averaged less errors, more violations, and less total errors and violations than did the losing teams in Group 0-DD

Correlations, using the Pearson-product moment method, were computed on the relationship between the differences in scores and the differences in total errors, total violations, and total errors and violations committed by the winning and losing teams for Groups A-N and 0-DD. These are shown below.

Correlation	Group A-N	Group 0-DD
TO A	+.54 ± .13	+.73 ± .08
TO B	-.26 ± .17	.14 ± .17
TO C	+.26 ± .17	+.50 ± .13

TO---Difference in points scored between winning and losing teams

TA---Difference in frequency of total errors committed by winning and losing teams

TB---Difference in frequency of total violations committed by winning and losing teams

TC---Difference in frequency of total errors and violations committed by winning and losing teams

The critical ratios between the winning and losing teams for total errors, total violations, and total errors and violations were computed for Groups A-N and 0-DD and were found to be as follows:

	Group A-N	Group 0-DD
Total errors----------	2.30	12.08
Total violations-------	1.33	1.76
Total errors and violations--	.77	6.15

On the basis of Sorenson's[1] table, indicating the chances in 1000 in which a true difference would be expected to occur, the following values were assigned:

12.02----------999.997+
6.16----------999.997+
2.20----------986.
1.76----------961.
1.33----------908.
.77----------779.

It should be noted that the difference in errors committed seemed to be of much greater significance in those games in which the point differences between winners and losers was great. However, the incidence of violations seemed to be of little consequence. The same was borne out by the correlations obtained in which the coefficient between the small point differential and the differences in errors was .54, and for the large point differential .73. Low negative correlations occured between the differences in violations and the differences in points scored for both groups.

In the low point differential group there were no statistically significant differences. However, in the wide point differential group the difference in total errors committed between winning and losing teams was statistically significant.

1/ Op. cit.

On the basis of Sorenson's[1] table, indicating the chances in 1000 in which a true difference would be expected to occur, the following values were assigned:

12.02	.999
8.10	.997
2.20	.986
1.76	.961
1.33	.908
.77	.778

It should be noted that the difference in errors committed seemed to be of much greater significance in those games in which the point differences between winners and losers was great. However, the incidence of violations seemed to be of little consequence. The same was borne out by the correlations obtained in which the coefficient between the small point differential and the differences in errors was .54, and for the large point differential .73. Low negative correlations occured between the differences in violations and the differences in points scored for both groups.

In the low point differential group there were no statistically significant differences. However, in the wide point differential group the differences in total errors committed between winning and losing teams was statistically significant.

1/ Op. cit.

Table VIII shows the thirty high school games arranged in order of increasing point difference. The games are designated by letters of the alphabet based upon increasing point differentials. The second column in the table shows the sequence in which the games were played.

TABLE VIII

THIRTY HIGH SCHOOL BASKETBALL GAMES ARRANGED IN ORDER OF INCREASING POINT DIFFERENCE

Game Designation	Game Number	Winner's Score	Loser's Score	Point Difference
A	29	36	35	1
B	30	30	29	1
C	18	26	25	1
D	4	25	24	1
E	11	25	24	1
F	5	35	33	2
G	28	33	31	2
H	27	32	30	2
I	17	44	41	3
J	21	36	33	3
K	24	32	29	3
L	22	36	31	5
M	23	24	18	6
N	10	37	30	7
O	20	35	27	8
P	3	38	29	9
Q	26	45	35	10
R	2	32	22	10
S	7	49	38	11
T	15	39	28	11
U	16	30	19	11
V	19	38	24	14
W	13	45	30	15
X	6	44	29	15
Y	12	49	32	17
Z	25	36	19	17
AA	14	46	27	19
BB	1	51	30	21
CC	9	48	21	27
DD	8	64	29	35

Table VIII shows the thirty high school games arranged in order of increasing point difference. The games are designated by letters of the alphabet based upon increasing point differentials. The second column in the table shows the sequence in which the games were played.

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Game Designation	Game Number	Winner's Score	Loser's Score	Point Difference
A	20	36	35	1
B	30	30	29	1
C	18	26	25	1
D	4	25	24	1
E	11	28	24	1
F	5	33	33	2
G	28	33	31	2
H	27	32	30	2
I	17	44	41	3
J	21	36	33	3
K	24	32	29	3
L	22	26	21	5
M	23	24	18	6
N	10	37	30	7
O	20	35	27	8
P	3	38	29	9
Q	26	45	35	10
R	8	32	22	10
S	7	46	36	11
T	15	30	29	11
U	16	30	19	11
V	19	38	24	14
W	13	45	30	15
X	6	44	29	15
Y	12	46	33	17
Z	25	36	19	17
AA	14	46	27	19
BB	1	31	30	21
CC	9	46	21	27
DD	8	64	29	35

The high school games above were arbitrarily divided into two groups, one group having a large point difference, the other having a small point difference. As will be noted above, the break was made at a point difference of nine points, or between games P and Q. The two groups will hereafter be referred to as A-P and Q-DD.

A study of the games by sequence shows that only five of the first fifteen games were in the group where the difference in points scored was the least. This, again, might be attributed to the fact that possibly the teams did not reach their maximum playing efficiency until the later part of the season.

Table IX indicates the frequencies, means, and standard errors of the total errors, total violations, and total errors and violations committed by winning teams in both groups A-P and Q-DD. Similar information for the losing teams will be found in Table X.

TABLE IX

THE FREQUENCY, MEAN, AND STANDARD ERROR OF THE MEAN OF TOTAL ERRORS, TOTAL VIOLATIONS, AND TOTAL ERRORS AND VIOLATIONS COMMITTED BY WINNING HIGH SCHOOL BASKETBALL TEAMS

	Group A-P Winning Teams		Group Q-DD Winning Teams	
Item	f	Mean	f	Mean
Total Errors	887	55.44 ± 1.72	686	49.00 ± 1.68
Total Violations	287	17.94 ± .92	279	19.93 ± 1.17
Total Errors and Violations	1174	73.38 ± 2.14	965	68.93 ± 2.21

TABLE X

THE FREQUENCY, MEAN, AND STANDARD ERROR OF THE MEAN OF TOTAL ERRORS, TOTAL VIOLATIONS, AND TOTAL ERRORS AND VIOLATIONS COMMITTED BY LOSING HIGH SCHOOL BASKETBALL TEAMS

	Group A-P Losing Teams		Group Q-DD Losing Teams	
Item	f	Mean	f	Mean
Total Errors	899	56.19 ± 1.60	847	60.50 ± 2.12
Total Violations	288	18.00 ± 1.44	259	18.50 ± 1.59
Total Errors and Violations	1187	74.19 ± 2.54	1106	79.00 ± 2.58

In the case of the high school teams, the tables above indicate that in group A-P, where the score differences were the smallest, the winning teams averaged more errors and more total errors and violations but less violations than did the winning teams in the group where the difference in points scored was the greatest. Also, the tables reveal that in the group where the difference in points scored was the smallest, the losing teams averaged less errors, violations, and total errors and violations than did the losing teams of the group where the difference in points scored was the greatest.

Correlations were computed, using the Pearson-product moment method, on the relationship between the differences in scores and the differences in total errors, total violations, and total errors and violations committed by the winning and losing teams for groups A-P and Q-DD. These are

TABLE X

THE FREQUENCY, MEAN, AND STANDARD ERROR OF THE MEAN OF TOTAL ERRORS, TOTAL VIOLATIONS, AND TOTAL ERRORS AND VIOLATIONS COMMITTED BY LOSING HIGH SCHOOL BASKETBALL TEAMS

Item	Group A-P Losing Teams f	Mean	Group Q-DD Losing Teams f	Mean
Total Errors	899	56.19 ± 1.60	847	60.50 ± 2.12
Total Violations	288	18.00 ± 1.44	259	18.50 ± 1.59
Total Errors and Violations	1187	74.19 ± 2.54	1106	79.00 ± 2.58

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Correlations were computed, using the Pearson-product moment method, on the relationship between the differences in scores and the differences in total errors, total violations, and total errors and violations committed by the winning and losing teams for Groups A-P and Q-DD. These are

shown below:

Correlation	Group A-P	Group Q-DD
r0 A	-.13 ± .17	+.54 ± .13
r0 B	-.15 ± .16	-.36 ± .15
r0 C	-.29 ± .15	+.34 ± .16

r0---Difference in points scored between winning and losing teams
rA---Difference in frequency of total errors committed by winning and losing teams
rB---Difference in frequency of total violations committed by winning and losing teams
rC---Difference in frequency of total errors and violations committed by winning and losing teams

The critical ratios between the winning and losing teams for total errors, total violations, and total errors and violations were computed for both groups A-P and Q-DD and the results are shown below:

	Group A-P	Group Q-DD
Total errors	.30	6.18
Total violations	.04	.89
Total errors and violations	.29	3.63

On the basis of Sorenson's[1/] table, indicating the chances in 1000 which a true difference would be expected to occur, the following values were assigned:

6.18	999.997 / in 1000
3.63	999.86 in 1000
.89	813 in 1000
.30	618 in 1000
.29	614 in 1000
.04	516 in 1000

All the correlations computed where the point differential was small at the high school level were negative and not

1/ Herbert Sorenson, Op. cit., p. 367

shown below:

Correlation	Group A-F	Group G-DD
rO A	-.13 ± .17	+.54 ± .13
rO B	-.15 ± .15	-.36 ± .15
rO C	-.29 ± .15	+.34 ± .16

rO---Difference in points scored between winning and losing teams

rA---Difference in frequency of total errors committed by winning and losing teams

rB---Difference in frequency of total violations committed by winning and losing teams

rC---Difference in frequency of total errors and violations committed by winning and losing teams

The critical ratios between the winning and losing teams for total errors, total violations, and total errors and violations were computed for both groups A-F and G-DD and the results are shown below:

	Group A-F	Group G-DD
Total errors----------	.30	6.13
Total violations----------	.04	.89
Total errors and violations------	.20	3.83

On the basis of Sorenson's[1] table, indicating the chances in 1000 which a true difference would be expected to occur, the following values were assigned:

6.13----------	999.999 + in 1000
3.83----------	999.86 in 1000
.89----------	in 1000
.30----------	in 1000
.20----------	in 1000
.04----------	in 1000

All the correlations computed where the point differential was small at the high school level were negative and not

[1] Herbert Sorenson, Op. cit., p. 367

significant. For the wide point differential group a correlation of .54 was obtained between the difference in errors committed and the difference in points scored. It will be noted that at both the high school and college level the correlations for both the large and small point difference groups between difference in points scored and differences in violations committed were small and negative.

The critical ratios above reveal that there were no significant differences at the 0.1 per cent level between winning and losing teams in the low point differential group. However, in the wide point differential group the difference in total errors committed between winning and losing teams was statistically significant.

significant. For the wide point differential group a correlation of .84 was obtained between the difference in errors committed and the difference in points scored. It will be noted that at both the high school and college level the correlations for both the large and small point difference groups between difference in points scored and differences in violations committed were small and negative.

The critical ratios above reveal that there were no significant differences at the 0.1 per cent level between winning and losing teams in the low point differential group. However, in the wide point differential group the difference in total errors committed between winning and losing teams was statistically significant.

CHAPTER IV

SUMMARY AND CONCLUSIONS

Summary.-- This study was undertaken in an attempt to discover the effect of errors and violations, committed in the game situation, upon the quality of a basketball team's performance. Data were collected on thirty intercollegiate and thirty interscholastic basketball games.

A list of errors, distinct from violations, was derived from interviewing a number of basketball coaches and students of the game. Prior to the opening of the season eight games, not reported in this study,were attended for the purpose of refining and practicing the collection technique. During these practice periods it was determined that only six of the original list of errors were objective enough to warrant inclusion in the study.

The list of eighteen violations used in the study were derived from the official rules.

The frequencies of the items were tallied in terms of winning and losing teams. Those items which were committed at least two hundred times for both winners and losers were treated statistically. The totals of the error items, violation items, and both errors and violations were also included in the statistical treatment. The considered items

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The frequencies of the items were tallied in terms of winning and losing teams. Those items which were committed at least two hundred times for both winners and losers were treated statistically. The totals of the error items, violation items, and both errors and violations were also included in the statistical treatment. The considered items

were the same for both the college and high school teams. They are shown below:

Error Items Considered

1. Intercepted pass
2. Committed a foul
3. Missed field goal recovered by opponents

Violation Item Considered

1. Caused ball to go out of bounds

Totals Considered

1. Total errors committed
2. Total violations committed
3. Total errors and violations committed

The winning teams, both high school and college, averaged fewer total errors and slightly more total violations than did the losing teams.

The hypothesis used in the study was that if the elements influencing the performance of opposing teams equally affected both teams and if the abilities of both were equal, the game should result in a tie with both teams committing the same number of errors and violations. If, then, all the elements other than errors and violations were held constant it would follow that as the difference in scores increased between winning and losing teams, the difference in violations and/or errors committed would widen with the losing teams committing the greater number.

Correlations between the differences in scores and the differences in errors and violations committed by winning and

were the same for both the college and high school teams.

They are shown below:

Error Items Considered

1. Intercepted pass
2. Committed a foul
3. Missed field goal recovered by opponents

Violation Item Considered

1. Caused ball to go out of bounds

Totals Considered

1. Total errors committed
2. Total violations committed
3. Total errors and violations committed

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Correlations between the differences in scores and the differences in errors and violations committed by winning and

losing teams were computed for both college and high school games.

The coefficients obtained would indicate that for the games considered, there was a reasonably high relationship between the differences in points scored and the differences in total errors committed. The correlation coefficient for the college games was ⁄.76, and for the high school games it was ⁄.62. The relationship between the differences in total violations committed and the differences in points scored was slight as borne out by the small negative correlations of -.05 for the college games and -.18 for the high school games. One individual error item, the differences in frequency of missed field goals recovered by opponents, correlated ⁄.62 with the differences in points scored in the high school games. None of the other individual error or violation items produced correlation coefficients high enough to indicate any relationship.

Critical ratios were computed on the selected items to determine whether or not there was any significant difference between winning and losing teams. The 0.1 per cent level of significance was chosen as a basis of determining whether or not such differences were true differences.

In the college games, the critical ratios derived would indicate that the differences obtained were due to factors other than chance for the following items:

losing teams were computed for both college and high school games.

The coefficients obtained would indicate that for the games considered, there was a reasonably high relationship between the differences in points scored and the differences in total errors committed. The correlation coefficient for the college games was +.76, and for the high school games it was +.82. The relationship between the differences in total violations committed and the differences in points scored was slight as borne out by the small negative correlations of -.05 for the college games and -.18 for the high school games. One individual error item, the differences in frequency of missed field goals recovered by opponents, correlated +.82 with the differences in points scored in the high school games. None of the other individual error or violation items produced correlation coefficients high enough to indicate any relationship.

Critical ratios were computed on the selected items to determine whether or not there was any significant difference between winning and losing teams. The 0.1 per cent level of significance was chosen as a basis of determining whether or not such differences were true differences.

In the college games, the critical ratios derived would indicate that the differences obtained were due to factors other than chance for the following items:

1. Intercepted passes
2. Missed field goal attempts recovered by the opponents
3. Number of errors committed

The critical ratios derived for the high school games would indicate that the differences obtained were due to factors other than chance for the following items:

1. Missed field goal attempts recovered by the opponents
2. Number of errors committed

The thirty college games were divided into two groups. The first group contained the fourteen games in which the difference in points scored between winning and losing teams was eleven points or less. The second group contained the sixteen games in which the difference in points scored between winning and losing teams was twelve points or more.

Correlations for both point differential groups were computed on the relationship between the differences in total errors committed and the differences in points scored, and the differences in total violations committed and the differences in points scored. In the low point differential group, the differences in errors committed correlation $\neq .54$ with the differences in points scored. The correlation in the high point differential group between the differences in total errors committed and the differences in points scored was $\neq .73$. In both the high and low point differential groups the

1. Intercepted passes

2. Missed field goal attempts recovered by the opponents

3. Number of errors committed

The critical ratios derived for the high school games would indicate that the differences obtained were due to factors other than chance for the following items:

1. Missed field goal attempts recovered by the opponents

2. Number of errors committed

The thirty college games were divided into two groups. The first group contained the fourteen games in which the difference in points scored between winning and losing teams was eleven points or less. The second group contained the sixteen games in which the difference in points scored between winning and losing teams was twelve points or more.

Correlations for both point differential groups were computed on the relationship between the differences in total errors committed and the differences in points scored, and the differences in total violations committed and the differences in points scored. In the low point differential group, the differences in errors committed correlated .54 with the differences in points scored. The correlation in the high point differential group between the differences in total errors committed and the differences in points scored was .73. In both the high and low point differential groups the

correlations obtained between the differences in total violations committed and the differences in points scored were low and negative.

Critical ratios were computed for the differences in total errors and the differences in total violations committed by winning and losing teams in both point differential groups. In the low point differential group there were no statistically significant differences at the 0.1 per cent level of significance between winning and losing teams. However, in the high point differential group a critical ratio of 12.02 was obtained for the differences in total errors committed by winning and losing teams. Since a critical ratio of 3.0 is needed to be significant at the 0.1 per cent level, it might be stated that the differences between winning and losing teams errors were due to something other than chance. As was found in the low point differential group, there was no statistically significant difference in the differences of violations committed by the winning and losing teams.

The thirty high school games were also divided into two groups. The first group contained the sixteen games in which the difference in points scored between winning and losing teams was nine points or less. The second group contained the fourteen games in which the difference in points scored between winning and losing teams was ten points or more.

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Critical ratios were computed for the differences in total errors and the differences in total violations committed by winning and losing teams in both point differential groups. In the low point differential group there were no statistically significant differences at the 0.1 per cent level of significance between winning and losing teams. However, in the high point differential group a critical ratio of 15.02 was obtained for the differences in total errors committed by winning and losing teams. Since a critical ratio of 3.0 is needed to be significant at the 0.1 per cent level, it might be stated that the differences between winning and losing teams errors were due to something other than chance. As was found in the low point differential group, there was no statistically significant difference in the differences of violations committed by the winning and losing teams.

The thirty high school games were also divided into two groups. The first group contained the sixteen games in which the difference in points scored between winning and losing teams was nine points or less. The second group contained the fourteen games in which the difference in points scored between winning and losing teams was ten points or more.

Correlations for both point differential groups were computed on the relationship between the differences in total errors committed and the differences in points scored, and the differences in total violations committed and the differences in points scored. In the low point differential group the correlations were low and negative. In the high point differential group a correlation of $+.54$ was obtained on the relationship between the differences in total errors committed and the differences in points scored.

Critical ratios were computed for the differences in the total errors committed and the differences in the total violations committed by winning and losing teams in both point differential groups. In the low point differential group there were no statistically significant differences at the 0.1 per cent level of significance. In the high point differential group a critical ratio of 6.18 was obtained for the differences in total errors committed by winning and losing teams. At the 0.1 per cent level of significance the critical ratio of 6.18 would indicate that the differences between winning and losing teams were due to some element other than chance. There was no statistically significant difference in the differences of violations committed by winning and losing teams.

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Critical ratios were computed for the differences in the total errors committed and the differences in the total violations committed by winning and losing teams in both point differential groups. In the low point differential group there were no statistically significant differences at the 0.1 per cent level of significance. In the high point differential group a critical ratio of 6.18 was obtained for the differences in total errors committed by winning and losing teams. At the 0.1 per cent level of significance the critical ratio of 6.18 would indicate that the differences between winning and losing teams were due to some element other than chance. There was no statistically significant difference in the differences of violations committed by winning and losing teams.

Conclusions.-- On the basis of the games included in this study, the following conclusions have been drawn

1. There was a relatively high relationship between the differences in total errors committed and the differences in points scored between the winning and losing basketball teams at the intercollegiate and interscholastic levels.

2. The differences in total errors committed by winning and losing basketball teams at the intercollegiate and interscholastic levels were statistically significant, indicating the influence of some factor other than chance. Further objective study is needed in order to determine the exact nature of the causes of the differences.

3. As the difference in points scored increased between winning and losing teams, at both the intercollegiate and interscholastic levels, the relationship between the differences in points scored and the differences in total errors committed increased in a positive direction, and the differences in total errors committed became more significant.

4. There was little, if any, relationship between the differences in total violations committed and the differences in points scored between the winning and losing teams at the intercollegiate and interscholastic levels.

5. The differences in total violations committed between winning and losing teams appeared more significant at the intercollegiate level than at the interscholastic level but

Conclusions.-- On the basis of the games included in this study, the following conclusions have been drawn:

1. There was a relatively high relationship between the differences in total errors committed and the differences in points scored between the winning and losing basketball teams at the intercollegiate and interscholastic levels.

2. The differences in total errors committed by winning and losing basketball teams at the intercollegiate and interscholastic levels were statistically significant, indicating the influence of some factor other than chance. Further objective study is needed in order to determine the exact nature of the causes of the differences.

3. As the difference in points scored increased between winning and losing teams, at both the intercollegiate and interscholastic levels, the relationship between the differences in points scored and the differences in total errors committed increased in a positive direction, and the differences in total errors committed became more significant.

4. There was little, if any, relationship between the differences in total violations committed and the differences in points scored between the winning and losing teams at the intercollegiate and interscholastic levels.

5. The differences in total violations committed between winning and losing teams appeared more significant at the intercollegiate level than at the interscholastic level but

in neither case were the differences statistically significant.

6. There was no tendency toward a higher correlation between the differences in points scored and the differences in total violations committed when the differences in points scored increased between winning and losing teams at either the intercollegiate or the interscholastic level. The differences in total violations committed between winning and losing teams, in the sixty games studied, were not statistically significant at either the intercollegiate or interscholastic levels. This would seem to indicate that violations, as they now appear in the rules, are equally fair to all teams in a game situation and have little effect upon the outcome of the game.

7. In the college games studied, there were statistically significant differences between the winning and losing teams in having passes intercepted and in having an attempted field goal recovered by the opponents. Although these differences were significant, the relationship between these differences and the differences in points scored was not high.

8. In the high school games studied, there was a statistically significant difference between the winning and losing teams in having an attempted field goal recovered by the opponents. The relationship between the differences in attempted field goals recovered by the opponents and the

differences in points scored between winning and losing teams were relatively high.

9. Winning college and high school teams averaged more errors when the differences in points scored were small than they did when the differences in points scored were large.

10. Losing college and high school teams averaged less errors when the differences in points scored was small than they did when the differences in points scored was large.

differences in points scored between winning and losing teams were relatively high.

9. Winning college and high school teams averaged more errors when the differences in points scored were small than they did when the differences in points scored were large.

10. Losing college and high school teams averaged less errors when the differences in points scored was small than they did when the differences in points scored was large.

BIBLIOGRAPHY

Allen, Forest C., Better Basketball, New York, McGraw-Hill Company, 1937

Bunn, John W., Basketball Methods, New York, The Macmillan Company, 1939

Dean, Everett S., Progressive Basketball, Stanford University Press, 1942

Lindquist, E. F., Statistical Analysis in Educational Research, Boston, Houghton-Mifflin Company, 1942

Sorenson, Herbert, Statistics for Students of Psychology and Education, New York, McGraw-Hill Company, 1936

The Official Basketball Guide, 1947-48, New York, A. S. Barnes and Company, 1947

Periodicals

Elbel, E. R. and Allen, Forest C., "Evaluating Team and Individual Performance in Basketball." Research Quarterly, Vol. XII, No. 3, October, 1941, pp. 538-555

Lambert, Eugene, "Research and Changes in Basketball Rules." The Official Basketball Guide, 1947-48, New York, A. S. Barnes and Company, 1947, p. 21

Staton, Wesley M., "A Study of Certain Factors Associated With Individual and Team Performance in Collegiate Basketball," Unpublished Master's Thesis, Boston University, 1947

APPENDIX

TABLE A

Frequencies of Errors and Violations Committed by Winning Basketball Teams in Thirty Intercollegiate Games

Game Designation	Game Number	*E-1	E-2	E-3	E-4	E-5	E-6	Total Errors
A	8	7	18	6	7	28	4	70
B	13	13	24	2	0	31	2	72
C	29	4	17	4	4	30	1	60
D	4	6	28	4	1	16	9	64
E	15	6	5	5	6	22	0	44
F	9	3	15	2	4	29	5	58
G	10	3	12	1	2	19	2	39
H	3	3	21	4	7	23	1	59
I	26	6	22	1	4	30	7	70
J	18	14	13	2	2	30	3	64
K	24	18	21	4	1	28	3	75
L	21	6	24	0	0	23	9	62
M	17	9	15	1	4	23	7	59
N	19	7	9	3	4	16	3	42
O	5	5	18	4	4	25	5	61
P	7	7	18	1	3	18	2	49
Q	30	10	19	4	2	27	4	66
R	27	7	17	6	4	30	0	64
S	6	11	21	3	3	21	4	63
T	23	11	12	2	3	22	4	54
U	2	8	18	6	0	27	4	63
V	14	16	14	5	6	18	1	60
W	22	6	16	4	10	11	5	52
X	12	4	18	6	1	26	3	58
Y	20	9	12	6	3	20	3	53
Z	11	7	22	0	2	15	6	52
AA	16	8	13	4	3	24	3	55
BB	28	4	26	2	4	22	6	64
CC	1	6	16	4	2	24	4	56
DD	25	8	12	3	0	16	2	41
--	Total	232	516	99	96	694	112	1749

*E - Error

TABLE A

Frequencies of Errors and Violations Committed by Winning Basketball Teams in Thirty Intercollegiate Games

Case Designation	Number of Games	*P-1	P-2	P-3	P-4	P-5	P-6	Total Errors
A	8	7	18	6	7	28	4	70
B	15	13	24	2	0	31	2	72
C	29	4	17	4	4	30	1	80
D	4	6	29	4	1	16	2	64
E	15	6	5	5	6	22	0	44
F	3	3	18	2	4	29	2	58
G	10	3	18	1	3	19	2	30
H	2	3	21	4	7	23	1	89
I	26	6	22	1	4	30	2	70
J	18	14	18	2	3	30	3	64
K	24	18	21	4	1	28	3	76
L	21	6	24	0	4	23	2	62
M	17	2	16	1	4	23	1	59
N	19	2	9	3	4	16	3	42
O	3	3	18	4	4	26	3	61
P	2	2	18	1	3	18	2	46
Q	30	10	19	4	2	27	4	66
R	27	2	17	6	4	30	0	64
S	6	11	21	3	3	21	4	63
T	23	11	12	2	3	22	4	54
U	2	8	18	6	0	27	4	65
V	14	16	14	3	6	16	1	60
W	22	6	18	4	10	11	3	52
X	12	4	18	6	1	26	3	58
Y	20	2	12	6	3	20	3	53
Z	11	2	22	0	2	16	0	52
AA	16	3	18	4	3	24	3	55
BB	28	4	26	2	4	22	6	64
CC	1	6	16	4	2	24	4	56
DD	25	8	12	3	0	16	2	41
--	Total	222	316	99	96	694	112	1749

*K - Error

TABLE A (Continued)

Frequencies of Errors and Violations Committed by Winning Basketball Teams in Thirty Intercollegiate Games

Game Designation	Game Number	*V-7	V-8	V-9	V-10	V-11	V-12	V-13	V-14	V-15
A	8	14	1	6	0	0	1	0	0	0
B	13	16	2	2	0	0	0	0	0	0
C	29	12	1	3	0	0	0	2	0	0
D	4	20	0	8	2	0	0	1	0	0
E	15	21	0	5	0	0	0	0	0	1
F	9	11	0	3	0	0	0	0	0	0
G	10	20	2	5	0	0	0	0	1	0
H	3	20	0	5	0	0	0	0	0	0
I	26	24	1	3	0	0	0	0	1	0
J	18	25	2	4	0	0	0	0	0	0
K	24	12	0	1	0	0	0	0	0	0
L	21	17	1	4	1	0	0	0	3	0
M	17	16	2	3	0	0	0	1	1	0
N	19	15	3	0	0	0	0	0	0	0
O	5	20	1	3	0	0	0	0	1	0
P	7	24	0	3	0	0	0	0	0	0
Q	30	17	1	1	0	0	0	0	0	0
R	27	12	0	3	0	0	0	1	0	0
S	6	10	0	6	1	0	0	0	1	0
T	23	14	0	3	1	0	0	0	0	0
U	2	22	0	3	0	0	0	0	0	0
V	14	21	1	1	0	0	0	0	0	0
W	22	27	1	5	0	0	0	1	1	1
X	12	10	0	3	0	0	0	0	0	0
Y	20	20	0	3	0	0	0	0	1	0
Z	11	11	0	6	0	0	0	0	0	0
AA	16	14	1	0	2	0	0	0	0	0
BB	28	24	5	5	0	0	0	2	0	0
CC	1	17	0	5	0	0	0	0	0	0
DD	25	20	0	4	0	0	0	0	0	0
	Total	526	25	106	7	0	1	8	10	2

*V - Violation

TABLE A (Continued)

Frequencies of Errors and Violations Committed by Winning Basketball Teams in Thirty Intercollegiate Games

Game Designation	Game Number	*V-7	V-8	V-9	V-10	V-11	V-12	V-13	V-14	V-15
A	8	14	1	6	0	0	1	0	0	0
B	15	16	2	3	0	0	0	0	0	0
C	29	12	1	8	3	0	0	1	0	0
D	4	20	0	3	0	0	0	0	0	1
E	19	21	0	3	0	0	0	0	1	0
F	9	11	0	3	0	0	0	0	0	0
G	10	20	2	3	0	0	0	0	1	0
H	3	20	1	3	0	0	0	0	0	0
I	26	24	0	4	0	0	0	0	0	0
K	16	25	1	4	0	0	0	0	0	0
J	24	12	0	3	1	0	0	0	1	0
M	21	17	2	3	0	0	0	1	0	0
N	17	16	1	3	0	0	0	0	1	0
O	18	15	1	3	0	0	0	0	1	0
P	7	20	1	3	0	0	0	0	0	0
Q	30	24	0	3	0	0	0	1	0	0
R	27	17	0	3	0	0	0	0	1	0
S	6	12	0	3	1	0	0	0	0	0
T	25	10	0	3	0	0	0	0	0	0
U	2	14	0	3	0	0	0	0	0	0
V	14	22	0	3	0	0	0	1	0	0
W	22	21	1	3	0	0	0	0	1	0
X	13	10	0	3	0	0	0	0	0	1
Y	20	20	0	3	0	0	0	0	0	0
Z	11	11	0	3	0	0	0	0	0	0
AA	16	14	1	3	0	0	0	0	0	0
BB	28	24	0	3	2	0	0	2	0	0
CC	1	17	0	3	0	0	0	0	0	0
DD	25	20	0	4	0	0	0	0	0	0
Total		556	25	106	7	0	1	8	10	2

*V - Violation

TABLE A (Continued)

Frequencies of Errors and Violations Committed by Winning Basketball Teams in Thirty Intercollegiate Games

Game Designation	Game Number	*V-16	V-17	V-18	V-19	V-20	V-21	V-22	V-23	V-24	Total Violations
A	8	0	0	0	0	0	0	0	0	0	22
B	13	0	0	0	0	0	0	0	0	0	20
C	29	0	0	0	0	0	0	0	0	0	18
D	4	0	0	0	0	0	0	0	0	0	31
E	15	0	0	0	0	0	0	0	0	0	27
F	9	0	0	0	0	0	0	0	0	0	14
G	10	0	0	0	0	0	0	0	0	0	28
H	3	0	0	0	0	0	0	0	0	0	25
I	26	0	0	0	0	0	0	0	0	0	29
J	18	0	0	0	0	0	0	0	0	0	31
K	24	0	0	0	0	0	0	0	0	0	13
L	21	0	0	0	0	0	0	0	0	0	26
M	17	0	0	0	0	0	0	0	0	0	23
N	19	0	0	0	0	0	0	0	0	0	18
O	5	0	0	0	0	0	0	0	0	0	25
P	7	0	0	0	0	0	0	0	0	0	27
Q	30	0	0	0	0	0	0	0	0	0	19
R	27	0	0	0	0	0	0	0	0	0	16
S	6	0	0	0	0	0	0	0	0	0	18
T	23	0	0	0	0	0	0	0	0	0	18
U	2	0	0	0	0	0	0	0	0	0	25
V	14	0	0	0	0	0	0	0	0	0	23
W	22	0	0	0	0	0	0	0	0	0	36
X	12	0	0	0	0	0	0	0	0	0	13
Y	20	0	0	0	0	0	0	0	0	0	24
Z	11	0	0	0	0	0	0	0	0	0	17
AA	16	0	0	0	0	0	0	0	0	0	17
BB	28	0	0	0	0	0	0	0	0	0	36
CC	1	0	0	0	0	0	0	0	0	0	22
DD	25	0	0	0	0	0	0	0	0	1	25
Total		0	0	0	0	0	0	0	0	1	686

*V - Violation

TABLE A (Continued)

Frequencies of Errors and Violations Committed by Winning Basketball Teams in Thirty Intercollegiate Games

Game	Games Played	*V-16	V-17	V-18	V-19	V-20	V-21	V-22	V-23	V-24	Total Violations
A	3	0	0	0	0	0	0	0	0	0	22
B	15	0	0	0	0	0	0	0	0	0	20
C	29	0	0	0	0	0	0	0	0	0	18
D	4	0	0	0	0	0	0	0	0	0	31
E	15	0	0	0	0	0	0	0	0	0	27
F	9	0	0	0	0	0	0	0	0	0	14
G	10	0	0	0	0	0	0	0	0	0	28
H	3	0	0	0	0	0	0	0	0	0	25
I	26	0	0	0	0	0	0	0	0	0	29
J	18	0	0	0	0	0	0	0	0	0	31
K	24	0	0	0	0	0	0	0	0	0	15
L	21	0	0	0	0	0	0	0	0	0	26
M	17	0	0	0	0	0	0	0	0	0	23
N	19	0	0	0	0	0	0	0	0	0	18
O	5	0	0	0	0	0	0	0	0	0	25
P	7	0	0	0	0	0	0	0	0	0	27
Q	30	0	0	0	0	0	0	0	0	0	19
R	27	0	0	0	0	0	0	0	0	0	18
S	6	0	0	0	0	0	0	0	0	0	18
T	23	0	0	0	0	0	0	0	0	0	18
U	2	0	0	0	0	0	0	0	0	0	26
V	14	0	0	0	0	0	0	0	0	0	23
W	22	0	0	0	0	0	0	0	0	0	26
X	18	0	0	0	0	0	0	0	0	0	15
Y	30	0	0	0	0	0	0	0	0	0	24
Z	11	0	0	0	0	0	0	0	0	0	17
AA	16	0	0	0	0	0	0	0	0	0	17
BB	28	0	0	0	0	0	0	0	0	0	26
CC	1	0	0	0	0	0	0	0	0	0	22
DD	28	0	0	0	0	0	0	0	0	1	28
Total		0	0	0	0	0	0	0	0	1	686

*V - Violation

TABLE B

Frequencies of Errors and Violations Committed by Losing Basketball Teams in Thirty Intercollegiate Games

Game Designation	Game Number	*E-1	E-2	E-3	E-4	E-5	E-6	Total Errors
A	8	5	18	4	7	42	3	79
B	13	10	12	7	1	23	7	60
C	29	9	13	4	3	23	4	56
D	4	11	25	2	4	24	3	69
E	15	4	10	3	3	28	2	50
F	9	11	18	3	1	31	3	67
G	10	14	15	3	1	30	3	66
H	3	3	16	5	3	39	3	69
I	26	7	17	4	7	36	6	77
J	18	16	19	1	4	32	5	77
K	24	6	18	2	3	38	4	71
L	21	7	26	0	3	27	6	69
M	17	7	17	3	5	25	2	59
N	19	9	14	5	2	22	1	53
O	5	14	20	7	6	24	4	75
P	7	7	20	5	2	24	2	60
Q	30	5	16	5	5	35	4	70
R	27	4	12	7	6	31	4	64
S	6	12	22	7	2	31	7	81
T	23	14	16	5	3	19	1	58
U	2	8	18	4	6	28	4	68
V	14	11	21	7	3	30	3	75
W	22	16	21	9	1	24	3	74
X	12	6	22	6	3	35	4	76
Y	20	11	14	4	3	31	7	70
Z	11	15	30	1	1	26	6	79
AA	16	9	20	6	4	37	0	76
BB	28	8	24	7	4	34	9	86
CC	1	14	21	2	2	36	4	79
DD	25	17	16	5	3	30	3	74
	Total	290	551	133	101	895	117	2087

*E - Error

TABLE B

Frequencies of Errors and Violations Committed by Leading Basketball Teams in Thirty Intercollegiate Games

Case	Designation	Number of Games	*E-1	E-2	E-3	E-4	E-5	E-6	Total Errors
A		8	5	18	4	7	42	3	79
B		15	10	18	7	11	23	7	80
C		29	9	13	4	3	23	4	56
D		4	11	23	3	4	24	3	69
E		13	4	10	3	3	23	2	50
F		9	11	18	3	1	31	3	67
G		10	14	15	3	1	30	3	66
H		3	3	18	3	3	29	3	59
I		26	7	17	4	3	36	6	77
K		18	16	19	1	4	28	5	72
L		24	6	18	2	3	28	4	71
M		21	7	28	0	3	27	2	69
N		17	7	17	3	3	28	2	59
O		19	9	14	3	3	22	1	53
P		5	14	20	3	3	24	4	73
Q		7	7	20	3	3	24	2	60
R		30	5	16	3	3	26	4	70
S		27	4	18	3	3	21	4	64
T		8	18	22	3	3	31	7	82
U		28	14	16	3	3	19	1	56
V		2	8	18	4	3	28	4	68
W		14	11	21	3	3	30	3	75
X		22	16	21	3	1	24	3	74
Y		12	6	22	3	3	26	4	76
Z		20	11	14	4	3	21	7	70
AA		11	15	30	1	1	26	5	79
BB		16	9	20	3	4	27	0	76
CC		28	8	24	2	4	24	4	86
DD		1	14	21	3	2	26	4	79
		28	17	16	3	3	20	3	74
	Total		290	851	135	101	895	117	2087

*E - Error

TABLE B (Continued)

Frequencies of Errors and Violations Committed by Losing Basketball Teams in Thirty Intercollegiate Games

Game Designation	Game Number	*V-7	V-8	V-9	V-10	V-11	V-12	V-13	V-14	V-15
A	8	22	0	1	0	0	0	0	1	0
B	13	8	0	7	0	0	0	0	0	0
C	29	12	3	2	0	0	0	0	0	0
D	4	17	0	6	1	0	0	1	0	0
E	15	20	0	3	0	0	0	0	0	0
F	9	12	2	3	0	0	0	0	0	0
G	10	12	0	2	0	0	0	0	0	0
H	3	13	0	2	0	0	0	0	0	0
I	26	18	0	6	1	0	0	0	1	0
J	18	23	0	3	0	0	0	0	0	0
K	24	21	0	1	0	0	0	0	0	0
L	21	12	3	5	0	0	0	0	2	0
M	17	9	1	3	0	0	0	0	1	0
N	19	10	0	4	0	0	0	0	0	0
O	5	13	0	5	0	0	0	0	0	0
P	7	22	0	1	0	0	0	0	0	0
Q	30	11	0	6	0	0	0	0	0	0
R	27	12	0	3	1	0	0	0	0	0
S	6	11	1	3	0	0	0	0	0	0
T	23	17	0	1	0	0	0	0	2	0
U	2	19	2	2	0	0	0	0	0	0
V	14	19	0	3	0	0	0	0	0	0
W	22	12	0	4	0	0	0	2	0	0
X	12	9	0	4	0	0	0	0	0	1
Y	20	16	0	2	0	0	0	0	0	0
Z	11	16	0	3	0	0	0	1	0	0
AA	16	9	1	4	0	0	0	1	0	0
BB	28	16	1	4	0	0	0	0	0	0
CC	1	15	0	5	0	0	0	2	0	0
DD	25	12	1	8	0	0	0	0	0	0
	Total	438	15	106	3	0	0	7	7	1

*V - Violation

TABLE B (Continued)

Frequencies of Errors and Violations Committed by Losing Basketball Teams in Thirty Intercollegiate Games

Game	Total Number of Errors Committed	*V-7	V-8	V-9	V-10	V-11	V-12	V-13	V-14	V-15
A	8	22	0	1	0	0	0	0	1	0
B	15	8	0	1	0	0	0	0	0	0
C	28	18	3	2	0	0	0	0	0	0
D	4	17	0	0	1	0	0	1	0	0
E	15	20	0	3	0	0	0	0	0	0
F	9	18	2	3	0	0	0	0	0	0
G	10	18	0	2	0	0	0	0	0	0
H	3	13	0	2	0	0	0	0	0	0
I	26	18	0	0	1	0	0	0	1	0
J	16	23	0	3	0	0	0	0	0	0
K	24	21	0	1	0	0	0	0	0	0
L	21	18	3	3	0	0	0	0	2	0
M	17	9	1	3	0	0	0	0	1	0
N	19	10	0	4	0	0	0	0	0	0
O	3	13	0	2	0	0	0	0	0	0
P	7	22	0	1	0	0	0	0	0	0
Q	30	11	0	3	0	0	0	0	0	0
R	27	12	0	3	1	0	0	0	0	0
S	6	11	1	3	0	0	0	0	0	0
T	23	17	0	1	0	0	0	0	2	0
U	3	19	2	1	0	0	0	0	0	0
V	14	19	0	3	0	0	0	0	0	0
W	22	12	0	4	0	0	0	2	0	0
X	12	9	0	4	0	0	0	0	0	1
Y	20	16	0	2	0	0	0	0	0	0
Z	11	16	0	3	0	0	0	1	0	0
AA	16	9	1	4	0	0	0	1	0	0
BB	28	16	1	4	0	0	0	0	0	0
CC	1	15	0	2	0	0	0	2	0	0
DD	25	12	1	8	0	0	0	0	0	0
Total	428	12	106	2	0	0	0	7	7	1

*V - Violation

TABLE B (Continued)

Frequencies of Errors and Violations Committed by Losing Basketball Teams in Thirty Intercollegiate Games

Game Designation	Game Number	*V-16	V-17	V-18	V-19	V-20	V-21	V-22	V-23	V-24	Total Violations
A	8	0	0	0	0	0	0	1	0	0	25
B	13	0	0	0	0	0	0	0	0	0	15
C	29	0	0	0	0	0	0	0	0	0	17
D	4	0	0	0	0	0	0	0	0	2	27
E	15	0	0	0	0	0	0	0	0	0	23
F	9	0	0	0	0	0	0	0	0	0	17
G	10	0	0	0	0	0	0	1	0	0	15
H	3	0	0	0	0	0	0	0	0	0	15
I	26	0	0	0	0	0	0	0	0	1	27
J	18	0	0	0	0	0	0	0	0	0	26
K	24	0	0	0	0	0	0	0	0	2	24
L	21	0	0	0	0	0	0	0	0	0	22
M	17	0	0	0	0	0	0	0	0	0	14
N	19	0	0	0	0	0	0	0	0	0	14
O	5	0	0	0	0	0	0	0	0	0	18
P	7	0	0	0	0	0	0	1	0	0	24
Q	30	0	0	0	0	0	0	0	0	0	17
R	27	0	0	0	0	0	0	0	0	0	16
S	6	0	0	0	0	0	0	0	0	0	15
T	23	0	0	0	0	0	0	0	0	0	20
U	2	0	0	0	0	0	0	0	0	0	23
V	14	0	0	0	0	0	0	0	0	0	22
W	22	1	0	0	0	0	0	0	0	2	21
X	12	0	0	0	0	0	0	0	0	0	14
Y	20	0	0	0	0	0	0	0	0	0	18
Z	11	0	0	0	0	0	0	0	0	0	20
AA	16	0	0	0	0	0	0	0	0	0	15
BB	28	0	0	0	0	0	0	0	0	0	21
CC	1	0	0	0	0	0	0	0	0	0	22
DD	25	0	0	0	0	0	0	0	0	0	21
Total		1	0	0	0	0	0	3	0	7	588

*V - Violation

TABLE B (Continued)

Frequencies of Errors and Violations Committed by Leading Basketball Teams in Thirty Intercollegiate Games

Game	Declared Games	*V-16	V-17	V-18	V-19	V-20	V-21	V-22	V-23	V-24	Total Violations
A	8	0	0	0	0	0	0	1	0	0	26
B	13	0	0	0	0	0	0	0	0	0	15
C	29	0	0	0	0	0	0	0	0	0	17
D	4	0	0	0	0	0	0	0	0	2	27
E	15	0	0	0	0	0	0	0	0	0	22
F	9	0	0	0	0	0	0	0	0	0	17
G	10	0	0	0	0	0	0	1	0	0	15
H	3	0	0	0	0	0	0	0	0	0	15
I	26	0	0	0	0	0	0	0	0	1	27
J	18	0	0	0	0	0	0	0	0	0	26
K	24	0	0	0	0	0	0	0	0	2	24
L	21	0	0	0	0	0	0	0	0	0	22
M	17	0	0	0	0	0	0	0	0	0	14
N	19	0	0	0	0	0	0	0	0	0	14
O	5	0	0	0	0	0	0	0	0	0	18
P	7	0	0	0	0	0	0	1	0	0	24
Q	30	0	0	0	0	0	0	0	0	0	17
R	27	0	0	0	0	0	0	0	0	0	16
S	8	0	0	0	0	0	0	0	0	0	15
T	23	0	0	0	0	0	0	0	0	0	20
U	2	0	0	0	0	0	0	0	0	0	23
V	14	0	0	0	0	0	0	0	0	0	22
W	22	1	0	0	0	0	0	0	0	2	21
X	18	0	0	0	0	0	0	0	0	0	14
Y	20	0	0	0	0	0	0	0	0	0	18
Z	11	0	0	0	0	0	0	0	0	0	20
AA	16	0	0	0	0	0	0	0	0	0	15
BB	28	0	0	0	0	0	0	0	0	0	21
CC	1	0	0	0	0	0	0	0	0	0	22
DD	28	0	0	0	0	0	0	0	0	0	21
Total	1	0	0	0	0	0	3	0	7	588	

*V - Violation

TABLE C

Frequencies of Errors and Violations Committed by Winning Basketball Teams in Thirty Interscholastic Games

Game Designation	Game Number	*E-1	E-2	E-3	E-4	E-5	E-6	Total Errors
A	29	2	15	5	17	22	1	62
B	30	2	17	5	2	23	2	51
C	18	7	12	7	2	19	3	50
D	4	15	12	4	3	28	3	65
E	11	7	11	7	9	11	6	51
F	5	8	8	3	6	20	4	49
G	28	6	15	2	5	15	3	46
H	27	6	22	6	6	19	2	61
I	17	7	18	5	12	26	5	73
J	21	7	11	2	10	20	4	54
K	24	7	12	4	10	16	3	52
L	22	6	12	5	6	23	3	55
M	23	2	17	3	9	17	4	52
N	10	5	15	6	8	20	0	54
O	20	10	12	3	7	20	2	54
P	3	15	11	0	8	21	3	58
Q	26	4	21	3	6	24	5	63
R	2	5	9	2	6	15	3	40
S	7	11	5	6	4	21	1	48
T	15	6	15	3	3	16	3	46
U	16	5	8	6	6	18	3	46
V	19	4	17	4	15	15	3	58
W	13	6	9	5	7	18	0	45
X	6	17	8	6	4	18	2	55
Y	12	6	17	5	9	13	3	53
Z	25	4	14	4	4	10	8	44
AA	14	9	14	6	7	10	1	47
BB	1	5	18	7	5	15	1	51
CC	9	10	6	3	11	12	4	46
DD	8	18	9	2	5	10	0	44
	Total	222	390	129	212	535	85	1573

*E - Error

TABLE C

Frequencies of Errors and Violations Committed by Winning Basketball Teams in Thirty Interscholastic Games

Team Designation	Game Number	*E-1	E-2	E-3	E-4	E-5	E-6	Total Errors
A	29	2	15	5	17	22	1	62
B	30	2	17	5	2	25	2	51
C	18	7	12	4	2	18	3	50
D	4	18	12	4	3	28	3	68
E	11	7	11	7	9	11	6	51
F	3	8	8	3	6	20	4	49
G	28	6	15	3	5	15	3	46
H	27	6	22	6	6	19	2	61
I	17	7	18	5	12	28	5	75
K	24	7	11	4	10	20	4	56
L	22	6	12	3	8	16	3	50
M	23	2	17	3	9	22	4	52
N	10	2	15	6	8	20	0	54
O	20	10	12	3	7	20	2	54
P	3	18	11	0	8	21	3	56
Q	26	4	21	2	6	24	3	82
R	2	4	9	2	6	18	3	40
S	7	11	8	6	4	21	1	48
T	15	6	15	3	3	16	3	46
U	16	2	8	6	6	18	3	46
V	19	4	17	4	13	15	3	58
W	13	6	9	3	7	18	0	45
X	6	17	8	6	4	18	2	55
Y	12	6	17	3	9	12	3	53
Z	25	4	14	4	4	10	8	44
AA	14	2	14	6	7	10	1	47
BB	1	5	18	7	5	15	1	51
CC	9	10	6	3	11	12	4	46
DD	8	18	9	2	5	10	0	44
Total		222	390	129	212	555	85	1573

*E - Error

TABLE C (Continued)

Frequencies of Errors and Violations Committed by Winning Basketball Teams in Thirty Interscholastic Games

Game Designation	Game Number	*V-7	V-8	V-9	V-10	V-11	V-12	V-13	V-14	V-15
A	29	11	1	4	0	0	0	0	0	0
B	30	15	2	1	2	0	0	1	0	0
C	18	10	0	1	0	0	0	1	0	0
D	4	9	0	11	0	0	0	0	0	1
E	11	21	1	0	2	0	0	0	1	0
F	5	17	1	3	0	0	0	0	0	0
G	28	10	1	4	0	0	0	0	0	0
H	27	12	0	2	0	0	0	0	0	0
I	17	11	2	7	0	0	0	0	0	0
J	21	11	2	0	0	0	0	0	0	0
K	24	8	1	1	2	0	0	1	0	0
L	22	9	1	6	0	0	0	0	0	0
M	23	7	1	6	1	0	0	1	0	0
N	10	12	2	4	0	0	0	0	1	0
O	20	12	1	1	0	0	0	0	0	2
P	3	14	3	5	0	0	0	1	0	0
Q	26	10	0	5	0	0	0	0	1	0
R	2	5	2	5	0	0	0	1	0	0
S	7	19	1	2	0	0	0	0	0	0
T	15	8	1	5	0	0	0	0	0	0
U	16	16	0	4	0	0	0	0	0	0
V	19	17	2	2	1	0	0	0	0	0
W	13	19	1	4	0	0	0	0	1	0
X	6	20	4	3	1	0	0	0	0	1
Y	12	7	2	2	1	0	0	0	2	0
Z	25	12	0	4	0	0	0	0	0	0
AA	14	12	3	6	0	0	0	1	0	0
BB	1	14	0	5	0	0	0	0	1	0
CC	9	19	0	1	0	0	0	0	1	0
DD	8	15	1	2	0	0	0	0	0	0
	Total	382	36	106	10	0	0	7	8	4

*E - Error

TABLE C (Continued)

Frequencies of Errors and Violations Committed by Winning Basketball Teams in Thirty Interscholastic Games

Case Designation	Case Number	*V-7	V-8	V-9	V-10	V-11	V-12	V-13	V-14	V-15
A	29	11	1	4	0	0	0	0	0	0
B	30	15	2	1	2	0	0	1	0	0
C	18	10	0	1	0	0	0	1	0	0
D	4	9	0	11	0	0	0	0	0	1
E	11	21	1	3	0	0	0	0	1	0
F	5	17	1	4	0	0	0	0	0	0
G	28	10	1	4	0	0	0	0	0	0
H	27	15	0	2	0	0	0	0	0	0
I	17	11	2	7	0	0	0	0	0	0
J	21	11	2	0	0	0	0	0	0	0
K	24	8	1	1	2	0	0	1	0	0
L	22	9	1	6	1	0	0	0	0	0
M	23	7	1	6	1	0	0	1	0	0
N	10	12	2	4	0	0	0	0	1	0
O	20	12	1	3	0	0	0	0	0	2
P	3	14	3	1	0	0	0	1	0	0
Q	26	10	0	3	0	0	0	0	1	0
R	2	8	2	5	0	0	0	1	0	0
S	7	19	1	2	0	0	0	0	0	0
T	15	8	1	2	0	0	0	0	0	0
U	16	16	0	4	0	0	0	0	0	0
V	19	17	2	3	1	0	0	0	0	0
W	13	19	1	4	0	0	0	0	1	0
X	6	20	4	2	1	0	0	0	0	1
Y	12	7	2	2	1	0	0	0	2	0
Z	25	12	0	4	0	0	0	0	0	0
AA	14	12	3	6	0	0	0	0	1	0
BB	1	14	0	5	0	0	0	0	1	0
CC	9	19	0	1	0	0	0	0	1	0
DD	8	15	1	2	0	0	0	0	0	0
Total		382	36	106	10	0	0	7	8	4

*E - Error

TABLE C (Continued)

Frequencies of Errors and Violations Committed by Winning Basketball Teams in Thirty Interscholastic Games

Game Designation	Game Number	*V-16	V-17	V-18	V-19	V-20	V-21	V-22	V-23	V-24	Total Violations
A	29	0	0	0	0	0	0	0	0	0	16
B	30	0	0	0	0	0	0	0	0	0	21
C	18	0	0	0	0	0	0	0	0	0	12
D	4	0	0	0	0	0	0	0	0	0	21
E	11	0	0	0	0	0	0	0	0	0	25
F	5	0	0	0	0	0	0	0	0	0	21
G	28	1	0	0	0	0	0	0	0	0	16
H	27	0	0	0	0	0	0	0	0	0	14
I	17	0	0	0	1	0	0	0	0	0	21
J	21	0	0	0	0	0	0	0	0	1	14
K	24	0	0	0	0	0	1	0	0	0	14
L	22	0	0	0	0	0	0	0	0	0	16
M	23	0	0	0	0	0	0	0	0	0	16
N	10	0	0	0	0	0	0	0	0	0	19
O	20	0	0	0	0	0	0	0	0	2	18
P	3	0	0	0	0	0	0	0	0	0	23
Q	26	0	0	0	0	0	0	0	0	0	16
R	2	0	0	0	0	0	0	0	0	0	13
S	7	1	0	0	0	0	0	0	0	0	23
T	15	0	0	2	0	0	0	0	0	1	17
U	16	0	0	0	0	0	0	0	0	0	20
V	19	0	0	0	0	0	0	0	0	0	22
W	13	0	0	0	0	0	0	0	0	0	25
X	6	0	0	0	0	0	0	0	0	0	29
Y	12	0	0	0	0	0	0	0	0	0	14
Z	25	0	0	0	0	0	0	0	0	1	17
AA	14	0	0	0	0	0	0	0	0	0	22
BB	1	0	0	0	0	0	0	0	0	2	22
CC	9	0	0	0	0	0	0	0	0	0	21
DD	8	0	0	0	0	0	0	0	0	0	18
Total		2	0	2	1	0	1	0	0	7	566

*V - Violation

TABLE C (Continued)

Frequencies of Errors and Violations Committed by Winning Basketball Teams in Thirty Intercholastic Games

Team Designation	Games Played	*V-16	V-17	V-18	V-19	V-20	V-21	V-22	V-23	V-24	Total Violations
A	29	0	0	0	0	0	0	0	0	0	16
B	30	0	0	0	0	0	0	0	0	0	21
C	18	0	0	0	0	0	0	0	0	0	12
D	4	0	0	0	0	0	0	0	0	0	21
E	11	0	0	0	0	0	0	0	0	0	25
F	5	0	0	0	0	0	0	0	0	0	21
G	28	1	0	0	0	0	0	0	0	0	16
H	27	0	0	0	0	0	0	0	0	0	14
I	17	0	0	0	1	0	0	0	0	0	21
J	21	0	0	0	0	0	0	0	0	1	14
K	24	0	0	0	0	0	1	0	0	0	14
L	22	0	0	0	0	0	0	0	0	0	16
M	23	0	0	0	0	0	0	0	0	0	16
N	10	0	0	0	0	0	0	0	0	0	19
O	20	0	0	0	0	0	0	0	0	2	18
P	3	0	0	0	0	0	0	0	0	0	23
Q	26	0	0	0	0	0	0	0	0	0	16
R	2	0	0	0	0	0	0	0	0	0	15
S	7	0	0	0	0	0	0	0	0	0	23
T	13	0	0	0	0	0	0	0	0	1	17
U	16	0	0	0	0	0	0	0	0	0	20
V	19	0	0	0	0	0	0	0	0	0	22
W	15	0	0	0	0	0	0	0	0	0	23
X	8	0	0	0	0	0	0	0	0	0	20
Y	12	0	0	0	0	0	0	0	0	0	14
Z	25	0	0	0	0	0	0	0	0	1	17
AA	14	0	0	0	0	0	0	0	0	0	22
BB	1	0	0	0	0	0	0	0	0	2	22
CC	9	0	0	0	0	0	0	0	0	0	21
DD	6	0	0	0	0	0	0	0	0	0	18
Total		2	0	2	1	0	1	0	0	7	566

*V - Violation

TABLE D

Frequencies of Errors and Violations Committed by Losing Basketball Teams in Thirty Interscholastic Games

Game Designation	Game Number	*E-1	E-2	E-3	E-4	E-5	E-6	Total Errors
A	29	9	14	3	11	17	6	60
B	30	7	19	2	7	20	1	56
C	18	5	9	8	7	18	3	50
D	4	13	7	8	8	19	3	58
E	11	18	14	3	7	12	3	57
F	5	13	13	7	9	17	4	63
G	28	5	9	4	5	27	3	53
H	27	7	12	4	7	14	6	50
I	17	7	21	9	9	18	7	71
J	21	3	18	4	5	26	3	59
K	24	3	13	1	4	21	3	45
L	22	7	12	2	9	26	3	59
M	23	6	16	4	12	20	4	62
N	10	8	13	6	6	15	1	49
O	20	6	13	7	5	20	4	55
P	3	18	12	2	2	15	3	52
Q	26	18	20	4	8	12	2	64
R	2	3	12	2	6	25	3	51
S	7	13	7	2	6	28	2	58
T	15	9	17	2	3	21	6	58
U	16	16	10	5	3	23	3	60
V	19	9	14	6	13	23	4	69
W	13	11	8	9	2	14	2	46
X	6	12	8	7	7	26	4	64
Y	12	2	12	4	2	19	5	44
Z	25	10	16	5	7	19	4	61
AA	14	6	20	11	9	20	3	69
BB	1	7	21	9	5	20	6	68
CC	9	13	18	5	4	29	1	70
DD	8	16	8	2	6	30	3	65
	Total	280	406	147	194	614	105	1746

*E-Error

TABLE D

Frequencies of Errors and Violations Committed by Losing Basketball Teams in Thirty Intercollegiate Games

Case	Designation	Number Games	*E-1	E-2	E-3	E-4	E-5	E-6	Total Errors
A		29	9	14	3	11	17	6	60
B		30	7	19	2	7	20	1	56
C		18	5	9	8	7	18	3	50
D		4	13	7	8	8	19	3	58
E		11	18	14	3	7	13	3	37
F		5	13	15	7	9	17	4	65
G		28	5	9	4	5	27	3	53
H		27	7	12	4	7	14	6	50
I		17	7	21	9	9	18	7	71
K		21	3	18	4	5	26	3	59
L		24	3	13	1	4	21	3	45
M		22	7	12	2	9	26	3	59
N		23	6	16	4	12	20	4	62
O		10	8	13	6	6	13	4	49
P		20	6	13	7	5	20	4	55
Q		3	18	12	5	3	18	3	52
R		26	18	20	4	8	12	2	64
S		2	3	12	2	6	25	3	51
T		7	13	7	2	6	28	2	58
U		15	9	17	2	3	21	6	58
V		16	16	10	2	3	23	6	60
W		19	9	14	6	13	23	4	69
X		13	11	8	2	2	14	2	46
Y		6	12	8	7	2	26	4	64
Z		18	3	12	4	3	12	3	44
AA		25	10	16	5	7	19	4	61
BB		14	6	20	11	3	20	3	63
CC		1	7	21	9	5	20	6	69
DD		9	13	18	5	4	29	1	70
		8	16	8	3	6	30	3	65
	Total		280	406	147	194	614	105	1746

*E-Error

TABLE D (Continued)

Frequencies of Errors and Violations Committed by Losing Basketball Teams in Thirty Interscholastic Games

Game Designation	Game Number	*V-7	V-8	V-9	V-10	V-11	V-12	V-13	V-14	V-15
A	29	14	0	1	0	0	0	0	1	0
B	30	12	0	6	0	0	0	0	0	0
C	18	16	1	1	0	0	0	0	0	0
D	4	20	4	4	1	0	0	0	0	0
E	11	13	0	1	0	0	0	1	0	0
F	5	16	1	0	0	0	0	0	0	0
G	28	13	0	0	0	0	0	0	0	0
H	27	13	1	7	0	0	0	0	0	0
I	17	16	4	9	0	0	0	1	0	0
J	21	11	1	1	1	0	0	0	0	0
K	24	8	1	2	0	0	0	0	0	0
L	22	14	0	0	0	0	0	0	0	0
M	23	10	1	1	0	0	0	0	0	0
N	10	10	0	3	0	0	0	0	0	0
O	20	16	0	0	0	0	0	0	0	0
P	3	18	3	2	0	0	0	0	0	0
Q	26	14	2	4	1	0	0	0	0	0
R	2	7	1	4	0	0	0	0	1	0
S	7	16	1	3	0	0	0	0	0	0
T	15	15	3	2	1	0	0	0	0	0
U	16	7	1	1	0	0	0	0	1	0
V	19	12	0	0	0	0	0	0	0	0
W	13	14	3	3	0	0	0	0	2	0
X	6	18	0	4	1	0	0	1	0	0
Y	12	14	2	3	0	0	0	0	1	0
Z	25	10	0	1	0	0	0	1	2	0
AA	14	16	0	4	1	0	0	0	0	0
BB	1	24	0	4	0	1	0	0	0	0
CC	9	6	1	2	0	0	0	0	0	0
DD	8	10	2	0	1	0	0	0	0	0
Total		403	33	73	7	1	0	4	8	0

*V - Violation

TABLE D (Continued)

Frequencies of Errors and Violations Committed by Losing Basketball Teams in Thirty Interscholastic Games

Case Designation	Number of Cases	*V-7	V-8	V-9	V-10	V-11	V-12	V-13	V-14	V-15
A	29	14	0	1	0	0	0	0	1	0
B	30	12	0	8	0	0	0	0	0	0
C	18	16	1	1	0	0	0	0	0	0
D	4	20	4	4	1	0	0	0	0	0
E	11	13	0	1	0	0	0	1	0	0
F	3	16	1	0	0	0	0	0	0	0
G	28	15	0	0	0	0	0	0	0	0
H	27	13	1	7	0	0	0	0	0	0
I	17	16	4	9	0	0	0	1	0	0
J	21	11	1	1	1	0	0	0	0	0
K	24	8	1	3	0	0	0	0	0	0
L	28	14	0	0	0	0	0	0	0	0
M	25	10	1	1	0	0	0	0	0	0
N	10	10	0	3	0	0	0	0	0	0
O	20	16	0	0	0	0	0	0	0	0
P	3	18	3	2	0	0	0	0	0	0
Q	26	14	2	4	1	0	0	0	0	0
R	2	7	1	4	0	0	0	0	1	0
S	7	16	1	3	0	0	0	0	0	0
T	15	13	3	2	1	0	0	0	0	0
U	16	7	1	1	0	0	0	0	1	0
V	19	12	0	0	0	0	0	0	0	0
W	15	14	3	3	0	0	0	0	2	0
X	6	18	0	4	1	0	0	1	0	0
Y	12	14	2	3	0	0	0	0	1	0
Z	25	10	0	1	0	0	0	1	2	0
AA	14	16	0	4	1	0	0	0	0	0
BB	1	24	0	4	0	1	0	0	0	0
CC	9	8	1	2	0	0	0	0	0	0
DD	8	10	2	0	1	0	0	0	0	0
Total	405		38	75	7	1	0	4	8	0

*V - Violation

TABLE D (Continued)

Frequencies of Errors and Violations Committed by Losing Basketball Teams in Thirty Interscholastic Games

		*V-16	V-17	V-18	V-19	V-20	V-21	V-22	V-23	V-24	Total Violations
A	29	0	0	0	0	0	0	0	0	0	16
B	30	0	0	0	0	0	0	0	0	0	18
C	18	0	0	0	0	0	0	0	0	0	18
D	4	0	0	0	0	0	0	0	0	0	29
E	11	0	0	0	0	0	1	0	0	0	16
F	5	0	0	0	0	0	0	0	0	0	17
G	28	0	0	0	0	0	0	0	0	0	13
H	27	0	0	0	0	0	0	0	0	0	21
I	17	0	0	1	0	0	0	0	0	0	31
J	21	0	0	1	0	0	0	0	0	0	15
K	24	0	0	0	0	0	0	1	0	0	12
L	22	0	0	0	0	0	0	1	0	0	15
M	23	0	0	0	0	0	0	0	0	0	12
N	10	0	0	0	0	0	0	0	0	0	13
O	20	0	0	0	0	0	0	0	0	1	17
P	3	0	0	1	0	0	0	0	0	1	25
Q	26	0	0	0	0	0	0	0	0	2	23
R	2	0	0	0	0	0	0	0	0	0	13
S	7	0	0	0	0	0	0	0	0	0	20
T	15	0	0	0	0	0	0	0	0	0	21
U	16	0	0	0	0	0	0	0	0	1	11
V	19	0	0	0	0	0	0	0	0	2	14
W	13	0	0	0	0	0	0	1	0	0	23
X	6	0	0	0	0	0	0	1	0	0	25
Y	12	0	0	0	0	0	0	0	0	2	22
Z	25	0	0	0	0	0	0	0	0	1	15
AA	14	0	0	0	0	0	0	0	0	0	21
BB	1	0	0	0	0	0	0	0	0	0	29
CC	9	0	0	0	0	0	0	0	0	0	9
DD	8	0	0	0	0	0	0	0	0	0	13
Total		0	0	3	0	0	1	4	0	10	547

*V - Violation

TABLE D (Continued)

Frequencies of Errors and Violations Committed by Losing Basketball Teams in Thirty Intercollegiate Games

		*V-16	V-17	V-18	V-19	V-20	V-21	V-22	V-23	V-24	Total Violations
A	29	0	0	0	0	0	0	0	0	0	16
B	30	0	0	0	0	0	0	0	0	0	18
C	18	0	0	0	0	0	0	0	0	0	18
D	4	0	0	0	0	0	0	0	0	0	29
E	11	0	0	0	0	0	1	0	0	0	16
F	5	0	0	0	0	0	0	0	0	0	17
G	28	0	0	0	0	0	0	0	0	0	15
H	27	0	0	0	0	0	0	0	0	0	21
I	17	0	0	1	0	0	0	0	0	0	31
J	21	0	0	1	0	0	0	0	0	0	15
K	24	0	0	0	0	0	0	1	0	0	13
L	22	0	0	0	0	0	0	1	0	0	15
M	25	0	0	0	0	0	0	0	0	0	13
N	10	0	0	0	0	0	0	0	0	0	13
O	20	0	0	0	0	0	0	0	0	1	17
P	3	0	0	0	1	0	0	0	0	1	25
Q	26	0	0	0	0	0	0	0	0	3	23
R	2	0	0	0	0	0	0	0	0	0	13
S	7	0	0	0	0	0	0	0	0	0	20
T	15	0	0	0	0	0	0	0	0	0	21
U	16	0	0	0	0	0	0	0	0	1	11
V	19	0	0	0	0	0	0	0	0	3	14
W	13	0	0	0	0	0	1	0	0	0	23
X	6	0	0	0	0	0	1	0	0	0	25
Y	12	0	0	0	0	0	0	0	0	3	22
Z	25	0	0	0	0	0	0	0	0	1	15
AA	14	0	0	0	0	0	0	0	0	0	21
BB	1	0	0	0	0	0	0	0	0	0	29
CC	9	0	0	0	0	0	0	0	0	0	9
DD	8	0	0	0	0	0	0	0	0	0	13
Total		0	0	3	0	0	1	4	0	10	547

*V - Violation

TABLE E

Differences in Errors Committed and Violations Committed by Winning and Losing Intercollegiate Basketball Teams Arranged in Order of Increasing Point Difference

Game Designation	Game Number	Difference in Points Scored	*E-1	E-2	E-3	E-4	E-5	E-6	Difference in Total Errors Committed
A	8	2	-2	0	-2	0	14	-1	9
B	13	2	-3	-12	5	1	-8	5	-12
C	29	3	5	-4	0	-1	-7	3	-4
D	4	6	5	-3	-2	3	8	-6	5
E	15	6	-2	5	-2	-3	6	2	6
F	9	6	8	3	1	-3	2	-2	9
G	10	9	11	3	2	-1	11	1	27
H	3	9	0	-5	1	-4	16	2	10
I	26	9	1	-5	3	3	6	-1	7
J	18	10	2	6	-1	2	2	2	13
K	24	10	-12	-3	-2	2	10	1	-4
L	21	11	1	2	0	3	4	-3	7
M	17	11	-2	2	2	1	2	-5	0
N	19	11	2	5	2	-2	6	-2	11
O	5	12	9	2	3	2	-1	-1	14
P	7	12	0	2	4	-1	6	0	11
Q	30	12	-5	-3	1	3	8	0	4
R	27	13	-3	-5	1	2	1	4	0
S	6	14	1	1	4	-1	10	3	18
T	23	16	3	4	3	0	-3	-3	4
U	2	16	0	0	-2	6	1	0	5
V	14	17	-5	7	2	-3	12	2	15
W	22	18	10	5	5	-9	13	-2	22
X	12	19	2	4	0	2	9	1	18
Y	20	26	2	2	-2	0	11	4	17
Z	11	27	8	8	1	-1	11	0	27
AA	16	27	1	7	2	1	13	-3	21
BB	28	29	4	-2	5	0	12	3	22
CC	1	35	8	-5	-2	0	12	0	23
DD	25	55	9	4	2	3	14	1	33
	Total		58	35	34	5	201	5	338

(-) indicates winners frequency is greater than frequency of losers.

*E - Error

TABLE B

Differences in Errors Committed and Violations Committed by Winning and Losing Intercollegiate Basketball Teams Arranged in Order of Increasing Point Difference

Case Designation	Case Number	Difference in Points Scored	*E-1	E-2	E-3	E-4	E-5	E-6	Difference in Total Errors Committed
A	8	2	-2	0	-2	0	14	-1	9
B	18	2	-2	-18	-5	1	-6	5	-18
C	29	3	2	-4	0	-1	-7	3	-4
D	4	6	2	-3	-2	3	8	-6	8
E	15	6	-2	-3	-2	-3	6	-2	6
F	3	6	8	3	1	-3	2	-2	9
G	10	9	11	3	2	-1	11	1	27
H	8	9	0	-6	1	-4	16	2	10
I	26	9	1	-6	-3	2	6	-1	7
J	16	10	2	-6	-1	2	2	3	13
K	24	10	-12	-3	-1	2	10	1	-4
L	21	11	1	2	2	0	4	-3	7
M	17	11	-2	2	2	1	2	-2	0
N	19	11	2	2	2	-2	6	-2	11
O	5	12	2	2	3	-1	-1	1	14
P	27	12	0	-2	1	-1	8	0	11
Q	30	12	-3	-2	1	3	8	0	4
R	27	13	-3	-2	1	2	10	-3	18
S	6	14	1	0	4	-1	-8	3	4
T	23	16	0	4	2	0	1	-3	3
U	2	16	0	0	-3	0	1	3	15
V	14	17	-3	7	2	-3	12	2	22
W	22	18	10	5	0	-2	13	-3	23
X	12	19	2	4	0	2	9	1	18
Y	20	23	2	8	-2	0	11	4	17
Z	11	27	2	8	1	-1	11	0	27
AA	16	27	1	7	3	1	13	-3	21
BB	28	29	4	-3	-5	0	12	3	22
CC	1	33	8	-4	-2	0	12	0	28
DD	25	55	9	4	2	5	14	1	35
Total			58	25	34	5	301	5	328

(-) Indicates winners frequency is greater than frequency of losers.

*E - Error

TABLE E (Continued)

Differences in Errors Committed and Violations Committed by Winning and Losing Intercollegiate Basketball Teams Arranged in Order of Increasing Point Difference

Game Designation	Game Number	*V-7	V-8	V-9	V-10	V-11	V-12	V-13	V-14	V-15
A	8	8	-1	-5	0	0	-1	0	1	0
B	13	-8	-2	5	0	0	0	0	0	0
C	29	0	2	-1	0	0	0	-2	0	0
D	4	-3	0	-2	-1	0	0	0	0	0
E	15	-1	0	-2	0	0	0	0	0	-1
F	9	1	2	0	0	0	0	0	0	0
G	10	-8	-2	-3	0	0	0	0	-1	0
H	3	-7	0	-3	0	0	0	0	0	0
I	26	-6	-1	3	1	0	0	0	0	0
J	18	-2	-2	-1	0	0	0	0	0	0
K	24	9	0	0	0	0	0	0	0	0
L	21	-5	2	1	-1	0	0	0	-1	0
M	17	-7	-1	0	0	0	0	-1	0	0
N	19	-5	-3	4	0	0	0	0	0	0
O	5	-7	-1	2	0	0	0	0	-1	0
P	7	-2	0	-2	0	0	0	0	0	0
Q	30	-6	-1	5	0	0	0	0	0	0
R	27	0	0	0	1	0	0	-1	0	0
S	6	1	1	-3	-1	0	0	0	-1	0
T	23	3	0	-2	-1	0	0	0	2	0
U	2	-3	2	-1	0	0	0	0	0	0
V	14	-2	-1	2	0	0	0	0	0	0
W	22	-15	-1	-1	0	0	0	1	-1	-1
X	12	-1	0	1	0	0	0	0	0	1
Y	20	-4	0	-1	0	0	0	0	-1	0
Z	11	5	0	-3	0	0	0	1	0	0
AA	16	-5	0	4	-2	0	0	1	0	0
BB	28	-8	-4	-1	0	0	0	-2	0	0
CC	1	-2	0	0	0	0	0	2	0	0
DD	25	-8	1	4	0	0	0	0	0	0
	Total	-88	-10	0	-4	0	-1	-1	-3	-1

(-) indicates winners frequency is greater than frequency of losers.
*V - Violation

TABLE X (Continued)

Differences in Errors Committed and Violations Committed by Winning and Losing Intercollegiate Basketball Teams Arranged in Order of Increasing Point Differences

Case	Designation	Case Number	*V-7	V-8	V-9	V-10	V-11	V-12	V-13	V-14	V-15
A		8	8	-1	-5	0	0	-1	0	1	0
B		15	-8	-5	5	0	0	0	0	0	0
C		29	0	2	-1	0	0	0	-2	0	0
D		4	-3	0	-2	-1	0	0	0	0	0
E		16	-1	0	-2	0	0	0	0	0	-1
F		9	1	2	0	0	0	0	0	0	0
G		10	-8	-2	-3	0	0	0	0	-1	0
H		3	-7	0	-3	0	0	0	0	0	0
I		26	-6	-1	3	1	0	0	0	0	0
J		18	-2	-2	-1	0	0	0	0	0	0
K		24	2	0	0	0	0	0	0	0	0
L		21	-5	2	1	-1	0	0	0	-1	0
M		17	-7	-1	0	0	0	0	-1	0	0
N		19	-3	-3	4	0	0	0	0	0	0
O		2	-7	-1	2	0	0	0	0	-1	0
P		7	-2	0	-2	0	0	0	0	0	0
Q		30	-6	-1	3	0	0	0	0	0	0
R		27	0	0	0	1	0	0	-1	0	0
S		6	1	1	-3	-1	0	0	0	-1	0
T		23	3	0	-2	-1	0	0	0	2	0
U		2	-3	2	-1	0	0	0	0	0	0
V		14	-2	-1	2	0	0	0	0	0	0
W		22	-15	-1	-1	0	0	0	1	-1	-1
X		12	-1	0	1	0	0	0	0	0	1
Y		20	-4	0	-1	0	0	0	0	-1	0
Z		11	3	0	-3	0	0	0	1	0	0
AA		16	-3	0	4	-2	0	0	1	0	0
BB		28	-3	-4	-1	0	0	0	-2	0	0
CC		1	-2	0	0	0	0	0	2	0	0
DD		25	-3	1	4	0	0	0	0	0	0
	Total		-80	-10	0	-4	0	-1	-1	-3	-1

(-) Indicates winners frequency is greater than frequency of losers.

*V - Violation

TABLE E (Continued)

Differences in Errors Committed and Violations Committed by Winning and Losing Intercollegiate Basketball Teams Arranged in Order of Increasing Point Difference

Game Designation	Game Number	*V-16	V-17	V-18	V-19	V-20	V-21	V-22	V-23	V-24	Difference in Total Violations Committed
A	8	0	0	0	0	0	0	1	0	0	3
B	13	0	0	0	0	0	0	0	0	0	-5
C	29	0	0	0	0	0	0	0	0	0	-1
D	4	0	0	0	0	0	0	0	0	2	-4
E	15	0	0	0	0	0	0	0	0	0	-4
F	9	0	0	0	0	0	0	0	0	0	3
G	10	0	0	0	0	0	0	1	0	0	-13
H	3	0	0	0	0	0	0	0	0	0	-10
I	26	0	0	0	0	0	0	0	0	1	-2
J	18	0	0	0	0	0	0	0	0	0	-5
K	24	0	0	0	0	0	0	0	0	2	11
L	21	0	0	0	0	0	0	0	0	0	-4
M	17	0	0	0	0	0	0	0	0	0	-9
N	19	0	0	0	0	0	0	0	0	0	-4
O	5	0	0	0	0	0	0	0	0	0	-7
P	7	0	0	0	0	0	0	1	0	0	-3
Q	30	0	0	0	0	0	0	0	0	0	-2
R	27	0	0	0	0	0	0	0	0	0	0
S	6	0	0	0	0	0	0	0	0	0	-3
T	23	0	0	0	0	0	0	0	0	0	2
U	2	0	0	0	0	0	0	0	0	0	-2
V	14	0	0	0	0	0	0	0	0	0	-1
W	22	1	0	0	0	0	0	0	0	2	-15
X	12	0	0	0	0	0	0	0	0	0	1
Y	20	0	0	0	0	0	0	0	0	0	-6
Z	11	0	0	0	0	0	0	0	0	0	3
AA	16	0	0	0	0	0	0	0	0	0	-2
BB	28	0	0	0	0	0	0	0	0	0	-15
CC	1	0	0	0	0	0	0	0	0	0	0
DD	25	0	0	0	0	0	0	0	0	-1	-4
Total		1	0	0	0	0	0	3	0	6	-98

(-) indicates winners frequency is greater than frequency of losers.

*V - Violation

TABLE X (Continued)

Differences in Errors Committed and Violations Committed by Winning and Losing Intercollegiate Basketball Teams Arranged in Order of Increasing Point Difference

Case	Designation	Number of Cases	*V-16	V-17	V-18	V-19	V-20	V-21	V-22	V-23	V-24	Difference in Total Violations Committed
A		8	0	0	0	0	0	0	1	0	0	3
B		13	0	0	0	0	0	0	0	0	0	-5
C		29	0	0	0	0	0	0	0	0	0	-1
D		4	0	0	0	0	0	0	0	0	2	-4
E		15	0	0	0	0	0	0	0	0	0	-4
F		9	0	0	0	0	0	0	0	0	0	3
G		10	0	0	0	0	0	0	1	0	0	-13
H		3	0	0	0	0	0	0	0	0	0	-10
I		26	0	0	0	0	0	0	0	0	1	-3
J		18	0	0	0	0	0	0	0	0	0	-5
K		24	0	0	0	0	0	0	0	0	3	11
L		31	0	0	0	0	0	0	0	0	0	-4
M		17	0	0	0	0	0	0	0	0	0	-9
N		19	0	0	0	0	0	0	0	0	0	-4
O		5	0	0	0	0	0	0	0	0	0	-7
P		7	0	0	0	0	0	0	1	0	0	-3
Q		30	0	0	0	0	0	0	0	0	0	-3
R		27	0	0	0	0	0	0	0	0	0	0
S		6	0	0	0	0	0	0	0	0	0	-3
T		25	0	0	0	0	0	0	0	0	0	2
U		2	0	0	0	0	0	0	0	0	0	-2
V		14	0	0	0	0	0	0	0	0	0	-1
W		22	1	0	0	0	0	0	0	0	2	-15
X		12	0	0	0	0	0	0	0	0	0	1
Y		20	0	0	0	0	0	0	0	0	0	-6
Z		11	0	0	0	0	0	0	0	0	0	3
AA		16	0	0	0	0	0	0	0	0	0	-2
BB		28	0	0	0	0	0	0	0	0	0	-15
CC		1	0	0	0	0	0	0	0	0	0	0
DD		25	0	0	0	0	0	0	0	0	-1	-4
	Total	1	0	0	0	0	0	0	3	0	6	-98

(-) indicates winners frequency is greater than frequency of losers.

*V - Violation

TABLE F

Differences in Errors Committed and Violations Committed by Winning and Losing Interscholastic Basketball Teams Arranged in Order of Increasing Point Difference

Game Designation	Game Number	Difference in Points Scored	*E-1	E-2	E-3	E-4	E-5	E-6	Difference in Total Errors Committed
A	29	1	7	-1	-2	-6	-5	5	-2
B	30	1	5	2	-3	5	-3	-1	5
C	18	1	-2	-3	1	5	-1	0	0
D	4	1	-2	-5	4	5	-9	0	-7
E	11	1	11	3	-4	-2	1	-3	6
F	5	2	5	5	4	3	-3	0	14
G	28	2	-1	-6	2	0	12	0	7
H	27	2	1	-10	-2	1	-5	4	-11
I	17	3	0	3	4	-3	-8	2	-2
J	21	3	-4	7	2	-5	6	-1	5
K	24	3	-4	1	-3	-6	5	0	-7
L	22	5	1	0	-3	3	3	0	4
M	23	6	4	-1	1	3	3	0	10
N	10	7	3	-2	0	-2	-5	1	-5
O	20	8	-4	1	4	-2	0	2	1
P	3	9	3	1	2	-6	-6	0	-6
Q	26	10	14	-1	1	2	-12	-3	1
R	2	10	-2	3	0	0	10	0	11
S	7	11	2	2	-4	2	7	1	10
T	15	11	3	2	-1	0	5	3	12
U	16	11	11	2	-1	-3	5	0	14
V	19	14	5	-3	2	-2	8	1	11
W	13	15	5	-1	4	-5	-4	2	1
X	6	15	-5	0	1	3	8	2	9
Y	12	17	-4	-5	-1	-7	6	2	-9
Z	25	17	6	2	1	3	9	-4	17
AA	14	19	-3	6	5	2	10	2	22
BB	1	21	2	3	2	0	5	5	17
CC	9	27	3	12	2	-7	17	-3	24
DD	8	35	-2	-1	0	1	20	3	21
Total			58	16	18	-18	79	20	173

(-) indicates winner's frequency is greater than loser's.

*E - Error

TABLE F

Differences in Errors Committed and Violations Committed by Winning and Losing Intercollegiate Basketball Teams Arranged in Order of Increasing Point Difference

Game Designation	Game Number	Difference in Points Scored	*E-I	E-S	I-S	P-A	E-S	E-S	Difference in Total Errors Committed
A	29	I	7	-I	-S	-6	-5	5	-S
B	30	I	5	S	-3	5	-3	-I	3
C	I8	I	-S	-3	I	5	-I	0	0
D	4	I	-S	-3	4	5	-9	0	-7
E	II	I	II	3	-4	-2	I	-3	6
F	3	2	3	4	4	3	-3	0	I4
G	28	2	-I	-6	2	0	I2	0	7
H	27	2	I	-I0	-2	I	-3	4	-II
I	I7	3	0	3	4	-3	-3	2	-2
J	2I	3	-4	7	2	-3	3	-I	3
K	24	3	-4	I	-3	-6	3	0	-7
L	22	3	4	0	-3	3	3	0	4
M	23	6	4	-I	I	3	3	0	I0
N	I0	7	3	-2	0	-2	-3	I	-3
O	20	8	-4	I	4	-2	0	2	I
P	3	9	3	I	2	-6	-3	0	-6
Q	26	I0	I4	-I	I	2	-I2	-3	I
R	2	I0	-2	3	0	0	I0	0	II
S	7	II	2	2	-4	2	2	I	I0
T	I5	II	3	2	-I	0	3	3	I2
U	I6	II	II	2	-I	-3	2	0	I4
V	I9	I4	3	-3	2	-2	3	I	II
W	I3	I5	3	-I	4	-3	-4	2	I
X	6	I5	-3	0	I	3	3	2	0
Y	I2	I7	-4	-3	-I	-7	6	2	-3
Z	25	I7	0	2	I	3	2	-4	I7
AA	I4	I9	-3	6	3	5	I0	2	22
BB	I	2I	2	3	2	0	2	3	I7
CC	9	27	3	I2	2	-7	I7	-3	24
DD	8	35	-2	-I	0	I	20	3	2I
Total			36	I6	I8	-I8	79	20	I76

(-) indicates winner's frequency is greater than loser's.

*E - Error

TABLE F (Continued)

Differences in Errors Committed and Violations Committed by Winning and Losing Interscholastic Basketball Teams Arranged in Order of Increasing Point Differences

Game Designation	Game Number	*V-7	V-8	V-9	V-10	V-11	V-12	V-13	V-14	V-15
A	29	3	-1	-3	0	0	0	0	1	0
B	30	-3	-2	5	-2	0	0	-1	0	0
C	18	6	1	0	0	0	0	-1	0	0
D	4	11	4	-7	1	0	0	0	0	-1
E	11	-8	-1	1	-2	0	0	1	-1	0
F	5	-1	0	-3	0	0	0	0	0	0
G	28	3	-1	-4	0	0	0	0	0	0
H	27	1	1	5	0	0	0	0	0	0
I	17	5	2	2	0	0	0	1	0	0
J	21	0	-1	1	1	0	0	0	0	0
K	24	0	0	1	-2	0	0	-1	0	0
L	22	5	-1	-6	0	0	0	0	0	0
M	23	3	0	-5	-1	0	0	-1	0	0
N	10	-2	-2	-1	0	0	0	0	-1	0
O	20	4	-1	-1	0	0	0	0	0	-2
P	3	4	0	-3	0	0	0	-1	0	0
Q	26	4	2	-1	1	0	0	0	-1	0
R	2	2	-1	-1	0	0	0	-1	1	0
S	7	-3	0	1	0	0	0	0	0	0
T	15	7	2	-3	1	0	0	0	0	0
U	16	-9	1	-3	0	0	0	0	1	0
V	19	-5	-2	-2	-1	0	0	0	0	0
W	13	-5	2	-1	0	0	0	0	1	0
X	6	-2	-4	1	0	0	0	1	0	-1
Y	12	7	0	1	-1	0	0	0	-1	0
Z	25	-2	0	-3	0	0	0	1	2	0
AA	14	4	-3	-2	1	0	0	-1	0	0
BB	1	10	0	-1	0	1	0	0	-1	0
CC	9	-13	1	1	0	0	0	0	-1	0
DD	8	-5	1	-2	1	0	0	0	0	0
	Total	21	-3	-33	-3	1	0	-3	0	-4

(-) indicates winner's frequency is greater than loser's.

*V - Violation

TABLE V (Continued)

Differences in Errors Committed and Violations Committed by Winning and Losing Intercollegiate Basketball Teams Arranged in Order of Increasing Point Differences

Case	Deviation Number Cases	*V-7	V-8	V-9	V-10	V-11	V-12	V-13	V-14	V-15
A	29	3	-1	-3	0	0	0	0	1	0
B	30	-3	-3	5	-3	0	0	-1	0	0
C	16	6	1	0	0	0	0	-1	0	0
D	4	11	4	-7	1	0	0	0	0	-1
E	11	-8	-1	1	-3	0	0	1	-1	0
F	5	-1	0	-3	0	0	0	0	0	0
G	28	3	-1	-4	0	0	0	0	0	0
H	27	1	1	3	0	0	0	0	0	0
I	17	3	3	3	0	0	0	1	0	0
J	21	0	-1	1	1	0	0	0	0	0
K	24	0	0	1	-3	0	0	-1	0	0
L	22	3	-1	-6	0	0	0	0	0	0
M	23	3	0	-6	-1	0	0	-1	0	0
N	10	-3	-3	-1	0	0	0	0	-1	0
O	20	4	-1	-1	0	0	0	0	0	-3
P	3	4	0	-3	0	0	0	-1	0	0
Q	26	4	3	-1	1	0	0	0	-1	0
R	2	3	-1	-1	0	0	0	-1	1	0
S	7	-3	0	1	0	0	0	0	0	0
T	15	-7	2	-3	1	0	0	0	0	0
U	16	-3	1	-3	0	0	0	0	1	0
V	19	-5	-3	-3	-1	0	0	0	0	0
W	13	-5	3	-1	0	0	0	0	1	0
X	6	-3	-4	1	0	0	0	1	0	-1
Y	12	7	0	1	-1	0	0	0	-1	0
Z	25	-3	0	-3	0	0	0	1	3	0
AA	14	4	-3	-3	1	0	0	-1	0	0
BB	1	10	0	-1	0	1	0	0	-1	0
CC	9	-13	1	1	0	0	0	0	-1	0
DD	8	-5	1	-3	1	0	0	0	0	0
Total		31	-3	-33	-3	1	0	-3	0	-4

(-) indicates winner's frequency is greater than loser's.

*V - Violation

TABLE F (Continued)

Differences in Errors Committed and Violations Committed by Winning and Losing Interscholastic Basketball Teams Arranged in Order of Increasing Point Differences

Game Designation	Game Number	*V-16	V-17	V-18	V-19	V-20	V-21	V-22	V-23	V-24	Difference in Total Violations Committed
A	29	0	0	0	0	0	0	0	0	0	0
B	30	0	0	0	0	0	0	0	0	0	-3
C	18	0	0	0	0	0	0	0	0	0	6
D	4	0	0	0	0	0	0	0	0	0	8
E	11	0	0	0	0	0	1	0	0	0	-9
F	5	0	0	0	0	0	0	0	0	0	-4
G	28	-1	0	0	0	0	0	0	0	0	-3
H	27	0	0	0	0	0	0	0	0	0	7
I	17	0	0	1	-1	0	0	0	0	0	10
J	21	0	0	1	0	0	0	0	0	-1	1
K	24	0	0	0	0	0	-1	1	0	0	-2
L	22	0	0	0	0	0	0	1	0	0	-1
M	23	0	0	0	0	0	0	0	0	0	-4
N	10	0	0	0	0	0	0	0	0	0	-6
O	20	0	0	0	0	0	0	0	0	-1	-1
P	3	0	0	1	0	0	0	0	0	1	2
Q	26	0	0	0	0	0	0	0	0	2	7
R	2	0	0	0	0	0	0	0	0	0	0
S	7	-1	0	0	0	0	0	0	0	0	-3
T	15	0	0	-2	0	0	0	0	0	-1	4
U	16	0	0	0	0	0	0	0	0	1	-9
V	19	0	0	0	0	0	0	0	0	2	-8
W	13	0	0	0	0	0	0	1	0	0	-2
X	6	0	0	0	0	0	0	1	0	0	-4
Y	12	0	0	0	0	0	0	0	0	2	8
Z	25	0	0	0	0	0	0	0	0	0	-2
AA	14	0	0	0	0	0	0	0	0	0	-1
BB	1	0	0	0	0	0	0	0	0	-2	7
CC	9	0	0	0	0	0	0	0	0	0	-12
DD	8	0	0	0	0	0	0	0	0	0	-5
	Total	-2	0	1	-1	0	0	4	0	3	-19

(-) indicates winner's frequency is greater than loser's.

*V - Violation

TABLE I (Continued)

Differences in Errors Committed and Violations Committed by Winning and Losing Interscholastic Basketball Teams Arranged in Order of Increasing Point Differences

Team Designation	Game Number	*V-16	V-17	V-18	V-19	V-20	V-21	V-22	V-23	V-24	Difference in Total Violations Committed
A	29	0	0	0	0	0	0	0	0	0	0
B	30	0	0	0	0	0	0	0	0	0	-3
C	18	0	0	0	0	0	0	0	0	0	6
D	4	0	0	0	0	0	0	0	0	0	8
E	11	0	0	0	0	0	1	0	0	0	-9
F	5	0	0	0	0	0	0	0	0	0	-4
G	28	-1	0	0	0	0	0	0	0	0	-3
H	27	0	0	0	0	0	0	0	0	0	-7
I	17	0	0	1	-1	0	0	0	0	0	10
J	21	0	0	1	0	0	0	0	0	-1	1
K	24	0	0	0	0	0	-1	1	0	0	-3
L	22	0	0	0	0	0	0	1	0	0	-1
M	23	0	0	0	0	0	0	0	0	0	-4
N	10	0	0	0	0	0	0	0	0	0	-6
O	20	0	0	0	0	0	0	0	0	-1	-1
P	3	0	0	1	0	0	0	0	0	1	1
Q	26	0	0	0	0	0	0	0	0	2	0
R	2	0	0	0	0	0	0	0	0	0	-3
S	7	-1	0	0	0	0	0	0	0	0	4
T	15	0	0	-2	0	0	0	0	0	-1	-9
U	16	0	0	0	0	0	0	0	0	1	-9
V	19	0	0	0	0	0	0	0	0	2	-8
W	13	0	0	0	0	0	0	1	0	0	-2
X	6	0	0	0	0	0	0	1	0	0	-4
Y	12	0	0	0	0	0	0	0	0	2	8
Z	25	0	0	0	0	0	0	0	0	0	-2
AA	14	0	0	0	0	0	0	0	0	0	-1
BB	1	0	0	0	0	0	0	0	0	-2	7
CC	9	0	0	0	0	0	0	0	0	0	-12
DD	8	0	0	0	0	0	0	0	0	0	-5
Total		-3	0	1	-1	0	0	4	0	3	-19

(-) Indicates winner's frequency is greater than loser's.

*V - Violation